DRAFT

San Clemente Shoreline Feasibility Study
Orange County, California

Environmental Appendix

Los Angeles District
June 2004

1.0 INTRODUCTION

The Los Angeles District of the U.S. Army Corps of Engineers (USACE) and the City of San Clemente (local non-federal sponsor) have prepared this Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) to analyze potential environmental impacts associated with the proposed action and alternatives for providing shoreline protection from coastal storms.

This EIS/EIR is an informational document to advise decision-makers and the general public of the benefits and potential adverse impacts of the project as well as feasible alternatives. This document assesses short-term, long-term, and cumulative impacts and benefits of the project. This EIS/EIR is also intended to provide information to all agencies whose discretionary approvals must be obtained for project actions.

This introductory section describes the project and the project location; discusses the purpose, need, and goals of the proposed action; provides background; and describes the regulatory framework/coordination associated with the project. Subsequent sections of the document describe project alternatives (Section 2.0 – to be provided in F4), baseline conditions of the study area (Section 3.0), and the environmental effects of the proposed action and alternatives (Sections 4.0) through 10.0 – to be provided in F4).

1.1 Proposed Action

The City of San Clemente is located in southern California about 100 km (60 miles) south of Los Angeles at the southern end of Orange County. Beach erosion is an ongoing problem along the San Clemente shoreline. Changes to the beach shoreline caused by erosion have reduced recreational opportunities and are threatening the stability of City facilities, private property, and a major southern California commuter rail corridor. This EIS/EIR examines alternatives, including beachfill, revetments and sheetpile walls, for addressing the San Clemente beach erosion problem.

For this project, the USACE is the Federal lead agency responsible for compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4331 (1996)), and the City of San Clemente is the lead agency under the California Environmental Quality Act (CEQA) of 1970 (Cal. Pub. Res. Code § 21,000 et seq.), as amended. This joint EIS/EIR has been prepared at the project-level of detail and complies with the requirements of both NEPA and CEQA (see section 1.6 for additional information regarding the environmental process and related documentation).

1.2 Location

The City of San Clemente is located along the coast of southern California at the southern end of Orange County near the border of San Diego County. The study area, which includes all 8 km (5 mi) of beaches within the city limits, extends from Shorecliff Beach to San Mateo Point. The communities of Capistrano Beach and Dana point are

located immediately up coast of the study area, while San Onofre State Beach Park and the Camp Pendleton Marine Corps Base are located to the south. The shoreline in the project area consists mainly of narrow (10-30 m NOTE: all units need to be uniform in the F4), gently to moderately sloping sandy beaches backed by high coastal bluffs. This sandy beach grades into a foreshore consisting of cobble and gravel pockets at the water's edge. At Mariposa point, located some 300 meters (984 feet) northwest of the San Clemente pier, off-shore rocks and boulders protrude from the high intertidal sand beach and become the dominant habitat type throughout the mid and low intertidal zones. The last extensive rocky intertidal habitat at Mariposa Point consists of a series of low-lying shale reef platforms that begin mid-beach and extend into the subtidal zone along with individual high relief boulders. A major railroad corridor linking the coastal cities of southern California, including Los Angeles and San Diego, runs between the beach and the coastal bluffs through San Clemente. Riprap along the seaward side of the rail corridor provides some protection to the tracks. The Southern California Regional Rail Authority (SCRRA) operates this corridor, which is one of the busiest in the nation. Loss of shore protection and recreational beach width is a continuous dilemma for the City of San Clemente and threatens the railroad. Since the railroad is assumed to be a constant feature throughout the project lifecycle, the seaward rail provided a convenient feature to define a horizontal alignment. The project reaches are defined based on an arbitrary assumed Station 0+000 at San Mateo Point.

Reach Description

Reach 1: Reach 1 extends from San Mateo Point at Sta 0+146 to Sta 1+115. The reach is 969 m long and is the southern portion of San Clemente State Beach. The beach width is zero at the southern boundary and gradually increases to 41 m wide. The railroad track elevation is approximately +6.4 m[1]. The railroad seaward slope incorporates the improved armor stone protection, has a slope of 1H:1V, and a crest elevation of approximately +7.0 m. There are no structures seaward of the railroad; some residential structures exist immediately landward of the railroad.

Reach 2: Reach 2 extends from Sta 1+115 to Sta 1+795. The reach is 680 m long and is encompassed within San Clemente State Beach. The beach width is approximately 40 m wide at the southern boundary and gradually decreases to 9 m wide. The railroad track elevation is approximately +6.4-7.6 m. The railroad seaward slope incorporates the conventional ballast construction, has a slope of 1H:1V, and a crest elevation of approximately +6.4-7.6 m. There are no structures landward of the railroad; the underpass for San Clemente State Beach is included within this reach.

Reach 3: Reach 3extends from Sta 1+795 to Sta 2+395. The reach is 600 m long is encompassed within San Clemente State Beach. The beach width is

[1] All elevations and/or depths are in meters referred to Mean Lower Low Water (MLLW) unless otherwise noted.

approximately 9 m wide at the southern boundary and quickly becomes zero throughout the remainder of the reach. The railroad track elevation is approximately +6.4 m. The railroad seaward slope incorporates the improved armor stone protection, has a slope of 1H:1V, and a crest elevation of approximately +7.0 m. There are no structures landward of the railroad; Calafia Beach Park is on the landward side of the railroad.

Reach 4: Reach 4 extends from Sta 2+395 to Sta 3+127. The reach is 732 m long and encompasses San Clemente State Beach on the southern 30% and City of San Clemente on the northern 70%. The beach width is approximately 30 m wide at the southern boundary, transitions to 60 m wide in the middle, and transitions to 10 m wide at the northern boundary. The railroad track elevation is approximately +6.3 m. The railroad seaward slope incorporates the conventional ballast construction, has a slope of 1H:1V, and a crest elevation of approximately +6.3 m. There are no structures landward of the railroad; some residential structures exist immediately landward of the railroad.

Reach 5: Reach 5 extends from Sta 3+127 to Sta 3+540. The reach is 413 long and is encompassed within the City of San Clemente. The beach width is 0 m wide throughout the reach. The railroad track elevation is approximately +6.5 m. The railroad seaward slope incorporates the improved armor stone protection, has a slope of 1H:1V, and a crest elevation of approximately +6.5 m. There are no structures landward of the railroad; some residential structures exist immediately landward of the railroad.

Reach 6: Reach 6 extends from Sta 3+540 to Sta 4+580. The reach is 1040 m long and is encompassed within the City of San Clemente. The beach width meanders from 0 m wide to 23 m to 0 m to 39 m and back to 0 m along the reach. The railroad track elevation is approximately +6.3 m. The railroad seaward slope incorporates the conventional ballast construction, has a slope of 1H:1V, and a crest elevation of approximately +6.9 m. This reach includes the majority of the significant structures along the beach.

Reach 7: Reach 7 extends from Sta 4+580 to Sta 5+661. The reach is 1081 m long and is encompassed within the City of San Clemente and is known as “Mariposa Point”. The beach width is 0 m wide throughout the reach. The railroad track elevation is approximately +6.5 m. The railroad seaward slope incorporates the improved armor stone protection, has a slope of 1H:1V, and a crest elevation of approximately +6.9 m. Historical information indicates that this reach has been armored with revetment since at least the 1930’s. There are no structures seaward or landward of the railroad.

Reach 8: Reach 8 extends from Sta 5+661 to Sta 6+008. The reach is 347 m long and is encompassed within the City of San Clemente. The beach width varies from 40 m wide at the southern boundary to 0 m at the northern boundary. The railroad track elevation is approximately +6.3 m. The railroad seaward slope

incorporates the conventional ballast construction, has a slope of 1H:1V, and a crest elevation of approximately +6.9 m.

Reach 9: Reach 9 extends from Sta 6+008 to Sta 7+109. The reach is 1101 m long and is encompassed within the City of San Clemente and is known as "Capistrano Shores". Capistrano Shores is a private community of manufactured housing constructed in the 1950's. A timber seawall that is fronted by a rubble mound rock revetment protects the reach. The armor stone is estimated to be 2-5 tons, has a slope of 1H:1V, and a crest elevation of approximately +6.0 m. The general condition of the revetment is not uniform and appears to be fair/poor along the entire length. The beach width is 0 m wide throughout the reach. The railroad is located substantially landward of the revetment and as such is no longer considered the project landward boundary. There are no structures seawards of the revetment.

Reach 10: Reach 10 extends from Sta 7+109 to Dana Point Harbor. The reach is approximately 5,000 m long and extends to the northern boundary of the study area. The Reconnaissance Report identified the potential project area from San Mateo Point to Capistrano Shores (Reach 1-9). The area north of Capistrano Shores is designated Reach 10 and will be considered only in the context of engineering considerations where physical continuity is required and/or necessary for the analysis.

1.3 Background

The San Clemente Shoreline project site is located in the City of San Clemente and bounded by the beach, the cities of San Juan Capistrano, Dana Point and unincorporated County land. The City was founded in 1925, incorporated in 1928 and was originally promoted as "The Spanish Village", designed to be a residential settlement featuring white stucco homes with red tile roofs sited on wide meandering streets with ocean views. The San Clemente Municipal Pier extends 400 m (1,200 feet) into the Pacific Ocean. It is part of the attraction for the tourist/recreationist visitation of San Clemente City Beach as well as the 40-ha (100-acre) State Beach, locally renowned as the premier surfing locale in the region.

Over the past 20 years, average beach widths in the City's beaches have been gradually reduced to about 15 meters (50 feet), a reduction of more than 50 percent compared to beach measurements from 1958 and 1981. San Clemente beaches were especially hard hit by the El Niño Southern Oscillation storms (ENSO) of 1983 and 1998. The greatest reduction in beach width during the last decade has occurred within the 1,370-meter (4,500-foot) stretch from Mariposa Street to Cristobal Street. Also, bottom elevation surveys along the Municipal pier since 1981 indicate that the cross-shore is deepened with a maximum fluctuation of about 4.6 meters (15 feet) at various locations.

The railroad is a vital link between the cities of San Diego, those in Orange County and Los Angeles. Due to chronic beach erosion, the railroad corridor between the bluff and the beach is threatened by undermining. As an expedient, the MetroLink has been randomly placing riprap stones along the most critical segment between North Beach and the Marine Safety Building to reduce wave energy impacts on the railroad tracks. Crews are dispatched during high tide and storm conditions to visually inspect for track damage that could cause derailments. The cumulative impact of stone placement over the years has resulted in a curtailment of lateral beach access. This railroad is a vital transportation link for passenger and freight service. During winter storm events, train service has been delayed in order to provide extra precautionary measures to move the trains safely through the area. In addition, the Department of Defense has designated this right-of-way as a Strategic Rail Corridor with great significance to National defense.

1.4 Purpose and Need

The purpose of the San Clemente Shoreline Project is to provide shore protection through nourishment of the beaches of the City of San Clemente. Developing and maintaining the beach is needed to prevent the severe beach erosion that results from winter storms, and to prevent damage to adjacent beachfront structures, including the heavily used rail line that runs along the beach through the city. In addition to the above, the loss of sand at the beach would have a negative impact on recreation, which supports the local economy, and would reduce the ecological functioning of the sand beach/littoral zone.

1.5 Project Authority

The San Clement Shoreline Feasibility Study, a Section 905(b) Analysis (WRDA 86), was prepared as an initial response to the energy and Water Appropriations Act of 2000, Public Law 106-60, 29 September 1999, which reads as follows:

The Committee recommendation includes funds for the Corps of Engineers to conduct a reconnaissance study investigating shoreline protection alternatives for San Clemente, California.

This EIS/EIR supports the Corps feasibility study for the project, which is ongoing; the feasibility study will incorporate the conclusions of this EIS/EIR. The Corps studied several alternative actions (both structural and nonstructural) to determine which approaches would be economically, technologically, and environmentally feasible. Some alternatives were eliminated as being infeasible; those that were retained for further consideration are analyzed in the EIS/EIR. The alternatives considered in the feasibility study and those considered further in this EIS/EIR, are described in Section 2.

1.6 Compliance with Environmental Laws and Regulations

Consideration of environmental laws, Executive Orders, and other policies in the planning and environmental review process is described below. It is anticipated that the City of San Clemente will use the environmental analysis included in this EIS/EIR to support permit applications and other required compliance activities pursuant to the respective laws, orders, and regulations.

1.6.1 NEPA/CEQA Process

National Environmental Policy Act of 1969 (42 U.S.C. § 4331 (1996)) as amended. NEPA is the nation's broadest environmental law, and it applies to all Federal agencies and most of the activities they manage, regulate, or fund that affect the environment. NEPA requires that environmental consequences and project alternatives be considered before a decision is made to implement a Federal project. NEPA has established requirements for preparation of an EIS for projects potentially having significant environmental impacts. Specifically, this EIS/EIR has been prepared in accordance with the requirements set forth in Section 102 of NEPA; CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. 1500 et seq.); and the U.S. Army Corps of Engineers, Department of the Army Environmental Quality, Procedures for Implementing NEPA (33 C.F.R. Parts 230 and 325).

California Environmental Quality Act (Public Resources Code 21000 et seq.). CEQA requires state and local agencies to disclose and consider the environmental implication of their actions. It further requires agencies, when feasible, to avoid or reduce the significant environmental impacts of their decisions. This document meets the goals, policies, and requirements of CEQA. Information and analysis to meet CEQA requirements are included within this EIS/EIR.

The involvement of a Federal agency and a local agency requires compliance with both NEPA and CEQA, respectively. For projects such as this, NEPA regulations and CEQA Guidelines encourage state and local agencies to prepare single joint documents that satisfy both Federal and state laws (Public Resources Code Section 21083.5; CEQA Guidelines Section 15222). Pursuant to these laws, the USACE and the City of San Clemente are preparing this joint EIS/EIR, with the USACE as the Federal lead agency and the City of San Clemente as the local lead agency. The analysis contained in this EIS/EIR has been prepared at a project-level of detail.

There are many similarities in the requirements of NEPA and CEQA. This document identifies when the requirements differ or are specific to the laws individually. It is important to note that the NEPA term *action* and CEQA term *project* are used interchangeably throughout this document.

1.6.2 Other Federal Laws and Regulations

Department of Army, U.S. Army Corps of Engineers Regulations. ER-200-2-2, 33 C.F.R. 230, March 1988, provides guidance for implementation of the procedural

provisions of NEPA for the Civil Works Program of the USACE. It supplements Council on Environmental Quality (CEQ) Regulations 40 C.F.R. 1500-1508, November 29, 1978 in accordance with 40 C.F.R. 1507.3, and is intended to be used in conjunction with the CEQ regulations. This regulation is applicable to all USACE personnel responsible for preparing and processing environmental documents in support of civil works programs.

ER 1105-2-100 (dated 22 April 2000) provides a set of procedures that are used for evaluating the effects of alternative water resources plans on environmental quality.

This EIS/EIR has been prepared in accordance with these Army regulations. Appropriate and responsible officials of the USACE have been involved in the preparation and review of this document.

Clean Water Act of 1977 (33 U.S.C. § 1251 [1994]). The Clean Water Act governs pollution control and water quality of waterways throughout the U.S. Its intent, in part, is to restore and maintain the biological integrity of the nation's waters. The goals and standards of the Clean Water Act are enforced through permit provisions. Sections 401, 402, and 404 of the Clean Water Act pertain directly to the proposed project. Section 401 requires certification from the California Regional Water Quality Control Board (RWQCB) that the proposed project is in compliance with established water quality standards, although some projects maybe exempted from this requirement as described in the following paragraph. To comply with Section 402 of the Clean Water Act, prior to construction, a Notice of Intent (NOI) will be submitted to the California State Water Resources Control Board. The USACE does not issue itself a 404 permit but must comply with the Clean Water Act.

Endangered Species Act (16 U.S.C. § 1531 [1994]). Under the Federal Endangered Species Act (FESA), take (defined as *hunt, pursue, catch, capture, or kill; or attempt to hunt, pursue, catch, capture, or kill)* of species federally listed as threatened or endangered is prohibited unless authorized by the U.S. Fish and Wildlife Service. Section 7(c) of the Endangered Species Act (ESA), as amended, requires that a federal agency request from the appropriate authority a list of threatened and/or endangered species present in an area of a proposed major federal action.

Fish and Wildlife Coordination Act (16 U.S.C. § 661 [1934]). The Fish and Wildlife Coordination Act (FWCA) directs the Department of the Interior (DOI) to provide assistance to and foster cooperation between Federal, state, and local agencies in order to promote wildlife conservation in water resource development programs. Agencies must consult with the section of the DOI that has jurisdiction over this project, in this case USFWS, on wildlife conservation measures to be implemented during construction and maintenance of the project.

National Historic Preservation Act (16 U.S.C. § 470 [1994]).
Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on cultural resources

eligible for the National Register of Historic Places (NRHP). Under the NHPA, cultural resources are referred to as historic properties. Historic properties include districts, sites, buildings, structures, and/or objects.

Executive Order 11593 Antiquities Act of 1906 (C.F.R. 154 [1906]). This Act sets forth the basic principle that the Federal government, acting for all the people, should work toward the protection, preservation, and public availability of the nation's historic and prehistoric resources. In addition, *Protection and Enhancement of the Cultural Environment*, dated 1971, has increased the responsibilities of the Federal government regarding preservation of important and significant cultural resources from Federal, Federally assisted, or Federally licensed activities. This mandate to preserve these resources applies to both public and private lands.

Clean Air Act (42 U.S.C. § 7401 [1994]). The Clean Air Act requires the adoption of national ambient air quality standards (NAAQS) to protect the public health and welfare from the effects of air pollution. Section 118 specifies that any Federal activity that may result in discharge of air pollutants must comply with Federal, state, interstate, and local requirements regarding control and abatement of air pollution. Section 176(c) requires that all Federal projects conform to EPA-approved or promulgated State Implementation Plan (SIP).

Executive Order 12989, "Environmental Justice in Minority Populations and Low-Income Populations" (59 Fed. Reg. 7629 [1994]). This Executive Order is designed to focus Federal attention on actions that affect environmental and human health conditions in minority and low-income communities. Information access and public participation are also a focus of the Executive Order. The USACE has encouraged public participation through public workshops, public scoping meetings, and public review of this document. Information regarding the project has been made available to the public locally at the USACE office in Los Angeles and at the City of San Clemente office. None of the project alternatives would disproportionately affect low-income or minority populations

Migratory Bird Treaty Act (16 U.S.C. § 703 [1994]) as amended. The Migratory Bird Treaty Act (1916), agreed between the U.S. and Canada; the Convention for the Protection of Migratory Birds and Animals (1936), agreed between the U.S. and Mexico; and subsequent amendments to these Acts provide legal protection for almost all breeding bird species occurring in the U.S. These acts restrict the killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. Certain gamebird species are allowed to be hunted for specific periods determined by Federal and state governments. The intent of the Migratory Bird Treaty Act is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey.

1.6.3 Other State Laws and Regulations

California Endangered Species Act (Cal. Fish and Game Code §§ 2050-2116). The California Endangered Species Act (CESA) parallels FESA. As a responsible agency, the California Department of Fish and Game (CDFG) has regulatory authority over state-listed endangered and threatened species.

Seismic Hazards Mapping Act of 1990 (Cal. Pub. Res. Code §§ 2690-2699). The purpose of this Act is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and hazards resulting from earthquakes. The Seismic Hazards Mapping Act requires that the state geologist delineate and map seismic hazard zones. Also, in accordance with the provisions of Public Resources Code, Section 2690 et seq., state, city, and county agencies are required to mitigate seismic hazards to protect public health and safety. The actions mandated by the Seismic Hazards Mapping Act are similar to those of the Alquist-Priolo Earthquake Fault Zoning Act, which only addresses surface fault-rupture hazards. To comply with this Act and to minimize the risk of potential damage from ground acceleration and ground shaking associated with a major earthquake, the project design and specifications incorporate measures from current seismic design codes.

1.7 AGENCY COORDINATION AND CONSULTATION

TO BE PROVIDED IN F4/F5

1.8 SCOPE OF THIS ENVIRONMENTAL ANALYSIS

1.8.1 Related NEPA/CEQA documents (EIS's/EA's/IS's/EIR's)

NEPA Documents

There are no federal projects in the study area.

CEQA Documents

Draft Mitigated Negative Declaration, Marblehead Coastal Beach Replenishment Project, City of San Clemente, 2000. This CEQA document describes a private beach nourishment project along the San Clemente shoreline.

1.8.2 Issues Studied in Detail

TO BE PROVIDED IN F4/F5

1.8.3 Issues Eliminated from Detailed Study

TO BE PROVIDED IN F4/F5

2.0 ALTERNATIVES

TO BE PROVIDED IN F4/F5

3.0 AFFECTED ENVIRONMENT – Existed Conditions

3.1 Geology

This section describes regional and site, onshore and offshore, topography and geology of the study area.

3.1.1 Regional Geology and Topography

3.1.1 Onshore. The San Clemente area comprises a part of the western flank of the Peninsular Ranges Geologic Province of southern California and includes areas of the western foothills of the Santa Ana Mountains and the southeastern flank of the San Joaquin Hills. The Peninsular Ranges extend from the Palos Verdes Peninsula in the north to the tip of Baja California in the south. The bedrock exposures in the area are comprised of marine sedimentary and volcanic rocks of Miocene, Pliocene and Pleistocene age. The bedrock formations both onshore and offshore consist of the San Mateo Formation, an arkosic sandstone of Pleistocene age, the Capistrano Formation, a series of silty shales, mudstones, siltstones and coarse sandstones of late Miocene and early Pliocene age and the San Onofre Breccia which is a series of volcanic breccias, ash flows and tuffs derived from large landslides during volcanic eruptions interbeded with layers of fine-grained volcanic ash deposited into fresh or salt water and is of Miocene age.

3.1.2 Site Geology and Topography

The offshore site geology was determined by the seismic survey plus 10 vibracore test holes drilled and sampled at random locations offshore of the City of San Clemente. The seismic survey was accomplished during the summer of 2002 and the vibracore sampling was accomplished from December 2002 through January 2003.

3.1.2.1 Offshore. The area offshore of San Clemente is a part of the Capistrano Bight, located at the eastern edge of the Gulf of Santa Catalina. This area is described as that part of the California coast known as the “Continental Borderland”, as there is no real continental shelf in this part of the coast. The area from Dana Point Harbor in Orange County downcoast to La Jolla in San Diego County is further defined as the “Oceanside Littoral Cell”. San Clemente beach is located in the extreme upper portion of this Littoral Cell. Published information for the bedrock exposures of most of the offshore area, exclusive of San Clemente Beach and the Channel Islands is sparse and is based upon scattered bottom samples and reconnaissance type geophysical investigations. Local Lifeguards and divers have informally stated that the ocean floor area offshore contained only bedrock and there were no deposits of beach sand.

In May 2002, bathymetric surveys, seismic surveys, sub-bottom profiling and a side scan sonar survey were conducted offshore of San Clemente beach to determine the presence or absence of shallow bedrock. The bathymetric survey indicates that the ocean bottom slopes gradually seawards for a distance of about 1,500 meters (9/10's of a mile) from elevation 0 MLLW at the shoreline to an elevation deeper than -32.8 meters (-100 feet) MLLW.

The geophysical surveys further indicated that the ocean floor is a bedrock surface covered with a thin veneer of littoral sediments that vary in thickness from about 0 to about 0.32 meters (1-foot) or more, out to a distance of 1,500 meters from the shoreline. The sediments are described as silty sands and sandy silts as determined by both the geophysical surveys conducted in the summer of 2002 and core samples derived from six vibracore test holes conducted in the January 2003. The vibracore holes were placed and sampled at random locations offshore of the City of San Clemente from the vicinity of the San Clemente Pier downcoast to San Mateo Point (the Orange County-San Diego County Line). The test holes were placed at least one mile offshore in order to hopefully avoid the shallow bedrock encountered by the seismic survey. Most of the holes were sampled at a mud line elevation of -16.4 meters (-50 feet) MLLW that is the limit of the most economical dredging operations. The exploration indicated that at one-mile (1.73 kilometers) seawards of the beach, the bedrock is still fairly shallow and was encountered between 1.3 meters (4 feet) and 3.3 meters (10 feet) below the mud line. The sediments encountered overlying the bedrock were silts and fine-grained sands, visually deemed unsuitable for beach replenishment. The exploration program was moved to Oceanside near the mouth of the Santa Margarita River, where previous reconnaissance exploration had indicated suitable material. See the paragraph entitled " Field Exploration Studies" for further details.

3.1.2.2 Onshore On the San Clemente beach marine erosion has formed a broad wave-cut terrace, which extends back from the coastline and lies several meters above sea level. This relatively flat lying surface is cut mainly in rocks of the Capistrano Formation of late Miocene and early Pliocene age and is mantled with poorly consolidated non-marine alluvial cover of Holocene and Pleistocene age and marine terrace deposits of Upper Pleistocene age. The non-marine cover consists of poorly bedded fine-grained sediments. The marine terrace deposits consist of poorly consolidated sands, sandstones and conglomerates. The beach, which begins at the foot of the wave-cut terrace, is composed of fine to medium grained sands and silty sands. Because of various seasonal cycles of sand deposition and erosion and the lack of adequate natural beach renourishment, the beach varies in width from 0 to 60 meters (0 to 200 feet). See the Coastal Engineering Appendix for more details about the width of the beach at each reach.

Field Exploration Studies – San Clemente Area. In August 2003, 25 additional test holes were sampled with a vibracore for a beach replenishment study at the Oceanside Beach. The purpose of the study was to determine if there was enough suitable sand for a beach replenishment program at both San Clemente and Oceanside. The depth of

the holes varied from 14.8 meters (48.5 feet) to 24.1 meters (70.2 feet). These holes were explored and sampled in the same proposed borrow area, but were placed to fill in the gaps between prior holes and obtain more information about certain reaches of the area in more detail. See Plate 1 of the Geotechnical Appendix for the Plan of Exploration and Figures 2 through 62 for the logs and the Beach Sand Gradations for these holes.

In 1999, SANDAG explored and sampled 35 vibracore holes in this same proposed borrow area. These vibracore holes varied in depth from 1.2 meters (3.6 feet) to 6.5 meters (17.2 feet). The mud line elevations of the holes varied from 16 meters (49 feet) MLLW to 22.9 meters (70 feet). The material was sampled, analyzed and classified as a top surficial layer of sandy silt about 3.9 meters (12 feet) thick underlain by a suitable layer of good beach sand, 1 meter (3 feet) to 4.2 meters (13 feet) thick.

SANDAG later removed some of the material in water deeper than –16.4 meters (50 feet) and placed the material on various portions of the beach in Oceanside and vicinity. See Figure 3 of the Geotechnical Appendix for the gradation and summary sheet for the logs of these holes. See Figures 63 through 97 of the Geotechnical Appendix for the more detailed logs of these holes.

3.1.2.3 Analysis of the Oceanside and the San Clemente Borrow Areas Details of the January and August 2003 vibratory core explorations can be found in Raabe (2003, 2004). As part of the contract for the January 2003 program, Group Delta, a Geotechnical Engineering Consultant, produced a report of project activities and results therein, entitled “Vibracore Exploration Program, San Clemente Beach Shoreline, Orange and San Diego Counties, California” (Group Delta, 2003) for the Geotechnical Branch of the Los Angeles District. Appendices to this report include:

Appendix A Field Exploration
Appendix B Core Penetration Logs
Appendix C Physical Test Results
Appendix D Chemical Test Results
Appendix E Photographic Documentation Additional details to be provided in F4]

San Clemente (Borrow Area #1). Sampled materials encountered with Borrow Site #1 were generally greenish-gray silty, very-fine grained sands and sandy silts with minor amounts of shell fragments. A soft, micaceous wackestone bedrock was encountered in (possibly 4) of the holes, causing refusal of the vibracore. These materials appeared to be too fine grained for beach nourishment purposes. Samples for chemical analysis were not taken, as the recovered sediments were too fine to be placed onto the beach.

Physical tests were performed on 8 selected samples from this borrow area. Group Delta reported that the samples show an average of 0.9% gravel, 51.5% sand and 47.6% fines passing the #200 sieve. The percent fines ranged from 21% to 67%. These

values show that the sampled area off of San Clemente Beach does not contain suitable compatible beach replenishment material.

Oceanside (Borrow Area #2). The sampled materials were generally fine-grained sands with local silty intervals and minor amounts of shell fragments. Significant laterally discontinuous gravel/cobble beds and lenses were encountered throughout the area, but the thicknesses generally averaged 2-feet (0.65 meters) or less. Often the gravel intervals possessed supporting dense silty sand material, which acted as a "pavement" holding the cobbles tightly, making the core penetration difficult. Shell and shell fragments were encountered throughout the area.

Twenty-five of the samples from the January 2003 exploration were combined into a single composite sample for the chemical analysis. A full tabulation of the results can be found in Appendix D of the Group Delta Report (Group Delta, 2003). All of the analyzed constituents were well below allowable limits. Table 2 is a summary of the results of the chemical analysis of these samples. No chemical samples were taken during the August 2003 exploration.

Physical tests were performed on 91 samples from this borrow area. The samples show an average of 12.3% gravel, 81.4% sand and 6.3% fines passing the #200 sieve. Figures 1 and 2 of the Geotechnical Appendix show the results of the gradation testing, as well as weighted averages for each test hole. As displayed in these figures, 25 out of the 27 test holes within the Oceanside site are beach-compatible, with the total fines of 12% or less

3.1.2.4 Sources of Sand Replenishment – Offshore. The primary natural sand supply for the beaches on the Pacific Coast is provided by the rivers and streams which transport the sediment to the coast during the winter and spring storms. Eroding sea cliffs and bluffs provide a secondary source of sediment. The waves and currents distribute the sand as it arrives at the coast. The adjacent beaches are replenished as the flow of sand moves alongshore. The predominate direction of the sand movement along southern California beaches is north to south, notwithstanding seasonal local variations. Generally the best places to find suitable beach sand for replenishment are at the deltas of the various streams that empty into the ocean. There are no such streams in the vicinity of San Clemente except for the mouth of San Juan Creek, which empties into the ocean at Capistrano Beach, south of Dana Point and north of San Clemente. Prior exploration by others has indicated that the sediments at this location are too fine-grained and are unsuitable for beach replenishment. Accordingly in January 2003 a vibracore exploration was first conducted about 0.61 kilometers (1 mile) offshore of San Clemente beach for a distance of about 3 to 3.6 kilometers (5-5.6 miles) parallel to the coastline to determine if suitable sand was present. The results were negative, so on the second day of the exploration the vibracore was moved offshore near the mouth of the Santa Margarita River, a few miles northwest of Oceanside Harbor. The results of the entire exploration are found in Geotechnical Appendix in the paragraph entitled "Field Exploration Studies". See Plate 1 for the Plan of Exploration

and Figures 1 and 4-8 for the logs of the vibracore holes located offshore of San Clemente beach.

3.1.2.5 Sources of Sand Replishment – Onshore. The only suitable source for beach sand would be at Camp Pendleton which is located between San Clemente and Oceanside or perhaps somewhere in the watershed of the San Juan River, near San Juan Capistrano. At the present time, exploration in Camp Pendleton is being considered in only one location behind a debris basin. However, use of this source would require several trucks carrying sand to San Clemente and delivering the sand to the beach via residential streets. Use of this sand source would also depend upon the U. S. Marine Corps allowing the trucks onto the Base to remove the sand. The Marine Corps only allows the sand behind the debris basin to be removed at certain times, and at the time of this study the sand was not available. Funding is presently not available to explore for sand at the San Juan River.

3.1.3 Geologic Hazards

3.1.3.1 Landslides. There have been several landslides mapped in the hills and mountains that form the eastern boundary of San Clemente Beach. These are shown on a geologic map accompanying "Natural Slope Stability as Related to Geology, San Clemente Area, Orange and San Diego Counties, California, Special Report 98" (Blanc and Cleveland, 1968) published by the California Division of Mines and Geology. The geologic map indicates that there are seven small areas of the bluff behind the beach extending from the San Clemente Pier to San Mateo Point, which contain landslide deposits. None of theses slides extend all of the way onto the beach so they are not a potential problem for beach nourishment. Neither the literature search nor the offshore seismic and side-scan sonar surveys indicate any landslides offshore of the beach.
Faults**.** Christianities Fault is not considered active. This information is based on the absence of displacement of the boulder layer just above the platform and also no displacement of the 90 feet of overlying dark-brown alluvial deposits above. White Sandstone lying northwest of the fault is part of the San Mateo Formation, deposited during the Pliocene, approximately 5 to 4 million years ago. Brown rock SW of the fault is part of the Monterey Formation. Its deposition is Miocene, between 20 to 15 million years ago. Ages of formations show that the NW side dropped with respect to the SE side, bringing the younger San Mateo SS against the older Monterey formation. Slightly curved fault plane is inclined about 60 degrees to the NW.

The Christianities Fault is a modest fault (for southern California); nevertheless it was thoroughly studied by geologist prior to construction of the San Onofre Nuclear Power Plant. Additional reference material negates any danger from this fault, associated with the San Onofre Nuclear Power Plant, as this is considered a non-active fault. Based upon undisturbed youthful surface deposits which blanket the fault trace, and an apparent lack of even minor seismic activity at depth, the Christianities are presently believed to be an inactive fault."

The wave-cut platform is expected to be approximately 120,000 to 125,000 years old. This information is determined by analyzing for the daughter products resulting from the radioactive decay of uranium in shells within the on radioactive decay, and correlating Corals in the Nestor terrace near San Diego. Most faults are considered "active" if they have moved in the last 11,000 to 35,000 years. Christianities Fault as exposed in sea cliff at the end of Echo Arch camp is between the San Mateo Sandstone and Monterey Shale.

3.1.4 Soils

According to data published by U.S. Department of Agriculture, Soil Survey, the study area is indicated as Beaches (115)(Table 3.1-1) with the exception of the area between Dana Point and Dana Cove (within Dana Point Harbor). That area is listed as Cieneba sandy loam (142), 30 to 75 percent slope, eroded. Adjacent Soils, from at or near Paso De Cristobal southward to San Mateo Point, are composed of Myford Sandy Loam (177), 9 to 30 percent slopes, eroded.

From Paseo De Cristobal northward near San Clemente Pier, adjacent Soils are Xerorthents loamy (220), cut and fill areas, 15 to 30 percent slopes. North of San Clemente Pier adjacent soils near the outfall of Segunda Deshecha (creek) are Calleguas Clay loam (134), in the Northernmost portion, 50 to 75 percent slopes, eroded, and Sorrento clay loam (209), 2 to 9 percent slopes, to the south of Calleguas Clay loam, and Aloe clay (101), 15 to 30 percent slopes south of Sorrento clay loam.

A small area near Poche, located near a trailer park, consists of Riverwash (191), with Cropley clay (149), 2 to 9 percent slopes, on each side of it. Capistrano Beach southward to Poche is listed as Cieneba sandy loam (142), 30 to 75 % slopes, eroded. Near San Juan Capistrano, San Juan Creek and Trabuco Creek converge with their combined outfall at Doheny State Beach (Capistrano Beach). These soils are depicted as Riverwash (191), and Metz loamy sand (163) on both sides of the outfall.

3.2 Water Quality

Near shore ocean water conditions for the San Clemente shoreline region are summarized as follows:

The tides in southern California are mixed, semi-diurnal tides with two unequal high tides and low tides roughly per day. Tidal variations are caused by the passage of two harmonic tidal waves; one with a period of 12.5 hours and one with a period of 25 hours. This causes a difference in height between successive high and low waters. The result is two high waters and two low waters each day, consisting of a higher high water and a lower high water, and a higher low water and a lower low water, respectively referred to as HHW, LHW, HLW, and LLW.

A greater than average range between HHW and LLW occurs when the moon, sun, and earth are aligned with each other to create a large gravitational effect. This spring tide corresponds to the phenomenon of a new or full moon. Neap tides, which occur during the first and third quarters of the moon, have a narrower range between HHW and LLW. In this situation, the moon, sun, and earth are perpendicular to each other, thereby reducing the gravitational effects on water levels.

The mean tidal range for the project area is 5.4 feet. The extreme range is about 9.5 feet. Water quality is typically characterized by salinity, pH, temperature, clarity, and dissolved oxygen (DO). Table 3.2 characterizes the overall water quality parameters for the project site.

- Water temperatures range from approximately 14°C (winter minimum) to 22°C (summer maximum). During summer, surface water temperatures are up to 10°C warmer than those in deeper waters are.

- Near shore salinity is generally uniform, from approximately 33 to 34 ppt. Seasonally, the near-surface salinity can decrease near the Prima Deshecha & Segunda Deshecha Watershed following storm-related discharges of freshwater and/or (historically) intermittent discharges of sewage into the river.

- Dissolved oxygen concentrations typically lie between approximately 6.5 and 10 milligrams per liter (mg/L), but may drop below approximately 5 mg/L at depths of 60 meters.

Light transmittance (indicating water clarity) has been measured at approximately 13 to 15 feet. Some reduction was associated with storm activity, particularly in shallower, near shore waters. Both light and nutrients are needed to support photosynthesis by attached and planktonic plants.

Nutrient concentrations are expected to be similar to those elsewhere in the Southern California Bight: nitrates at approximately 5 to 200 nanomoles per liter; phosphates at approximately 100 to 500 nanomoles per liter; and ammonium at approximately 300 nanomoles per liter. Discharges from the Prima Deshecha & Segunda Deshecha likely represent an important seasonal source of nutrients to nearshore waters. Upwelling events also contribute nutrients to surface waters.

Historically, bacterial levels in nearshore surface waters of the study area have been affected by episodic discharges of domestic sewage carried by the Prima Deshecha & Segunda Deshecha and flowing north along the coast. These releases have resulted in beach postings of health warning sign where the ocean and/or bay water failed to meet biological standards. In 2001, Capistrano County Beach had 5 health warning sign postings during a total of 98 days, Capistrano Bay District Beach had 5 health warning postings during a total of 31 days, Poche Beach had 3 health warning sign postings during a total of 145 days, San Clemente City and State Beach had 4 health warning

sign postings during a total of 13 days. Facility problems resulting in discharges of untreated sewage to the Prima Deshecha & Segunda Deshecha still occur occasionally.

Table 3.1-1. Soils of the San Clemente Project Area.

No.	Location	Description
115	Beaches	Consists of sandy, gravelly, or cobble coastal shores that are washed and rewashed by tidal and wave action. These areas may be partly covered with water during high tides or stormy periods. They support little or no vegetation and have no agricultural value. Some are excellent recreational areas. Runoff is very slow, and the erosion hazard is high. Present land use is recreation and urban development. Capability unit **VIIIw-1** (19) – This unit consists of Riverwash, Beaches and Tidal flats. Beaches are sandy, gravelly or cobble coastal shores. Tidal flats are nearly level, poorly drained, stratified clayey to sandy deposits that are adjacent to bays and lagoons along the coast and are high in salts. Both are subject to tidal action and may be at least partly inundated by high tides. Riverwash consists of sandy, gravelly, cobble, stony and bouldery deposits along stream channels that are subject to stream overflow. Range site not assigned; Storie index less that 10 (nonagricultural)

Table 3.2 Water Quality Characteristics

Parameters	Project Site
Salinity (ppt)	22 to 34
Surface Temperature (F)	57.2 to 67.1
PH	7.4 to 7.6
Clarity (ft)	13 to 15

Dissolved Oxygen (DO)	6.5 to 10

3.3 Biological Resources

The conditions of the biological resources in the vicinity of the proposed beach fill areas along the San Clemente coastline are based upon existing literature on the Southern California Bight (SCB--that area of the eastern Pacific Ocean along the coast of southern California from Pt. Conception in the north to Baja California in the south--) as well as intertidal reconnaissance site surveys conducted on March 13, 2000, and a subtidal reconnaissance survey conducted on June 26, 2000 by Coastal Resources Management (CRM).

The predominant intertidal habitat along San Clemente's shoreline is sandy beach, although some rocky outcrops that extend from mid-beach to the low intertidal are present at Mariposa Point (*Reach 7*), north of San Clemente Pier (Figure 3.3-1). Beyond the surf zone, the seafloor is a mosaic of sand and low-to-high relief patch reef. Some pinnacles of the reef are visible in the nearshore zone at low tide while two prominent offshore pinnacles break the surface offshore of Mariposa Point and south of the San Clemente Pier. Other reef habitats are located south of the pier offshore of T-Street that extend west, and then north around the end of the San Clemente pier, and secondly, offshore San Mateo Point (*Reach 1*)(Figure 3.3-1). Sensitive biological resources are found within a broad band of the region between San Clemente and Oceanside that have a potential to be affected by the beach stabilization/protection projects. However, there are a few species that may use the nearshore zone for foraging, the California least tern (*Sterna antillarum browni*), the California brown pelican (*Pelecanus occidentalis occidentalis*)

3.3.1 Marine Shoreline and Offshore Habitats

3.3.1.1 Vegetation

Three types of vegetated habitats, nearshore kelp and macroalgae, surfgrass beds, and offshore kelp beds, are present in the intertidal to subtidal habitats off San Clemente. Although the predominant intertidal habitat along San Clemente's shoreline is sandy beach, an area of rocky intertidal is present at Mariposa Point (*Reach 7*), 3200 ft. north of the San Clemente Pier (figure 3.3-1). Boulders and rocky outcroppings in this area support a variety of algal species. In the high intertidal, boulders support filamentous green algae (*Enteromorpha* spp.). The mid to low intertidal algae composition is dominated by encrusting red algae (*Lithophyllum* spp.*, Lithothamnion* spp.), encrusting brown algae (*Pseudolithoderma* spp.), and coralline algae (*Corallina* spp.). Filamentous red algae, consisting of several species, and green algae (*Enteromorpha* spp. and *Ulva* spp.) also occur in these zones. Larger brown algae species colonize the base of the intertidal reef throughout the area, including palm kelp (*Eisenia aborea*) and feather boa kelp (*Egregia menziesii*). Surfgrass (*Phyllospadix* spp.) is present in the low intertidal

beginning approximately 300 ft. offshore of the sand beach. Surfgrass is present throughout the low intertidal platform of Mariposa Point (Figure 3.3-1). Other offshore rocks are found approximately 6,400 ft. (*Reach 4*) south of the San Clemente Pier.

The shallow subtidal zone for much of the project area is a mixture of sand and boulder, with occasional outcrops of exposed shale bedrock. The subtidal areas between North Beach and Mariposa Point and offshore of Linda Lane, Mariposa Point, and T Street support filamentous red algae, coralline algae, crustose coralline algae, feather boa kelp, palm kelp, and surfgrass (Figure 3.3-1). Historically, offshore kelp beds, dominated by giant kelp with an understory of feather boa kelp and palm kelp, have been prevalent along this section of coastline, but within the last several years, the canopy has experienced a sharp decline (Coastal Resources Management 2000). During surveys in June 2000, Coastal Resources Management (CRM) found low density kelp beds with little or no surface canopy 610 m (2000 ft) off of Mariposa Point and 1219 m (4,000 ft) from North Beach at depths between –7 and –8.5 m (-23 and –28 ft) MLLW (Figure 3.3-1). Another bed was observed 198 m (650 ft) off of San Clemente Pier (T Street) at a depth of 4.9 m (16 ft) in October 1999. This patch was not observed during the June 2000 survey (CRM, 2000). Much of the kelp observed in June 2000 was ragged and covered with fouling ectoprocts (*Bryozoa*); however newly settled recruit plants were also present (CRM, 2000).

3.3.1.2 Wildlife

3.3.1.2.1 Soft Bottom Communities

The sandy beach within the project area is variable in width. The North Beach Project Site is immediately adjacent to the Metrolink Station and parking lot, and just south of a row of beachfront mobile homes. This beach is typically narrow and is backed by a low stone revetment along portions of its length. It is composed of medium to coarse sand. The shoreline at Mariposa Point consists of a riprap backshore environment that protects the railroad tracks. Immediately seaward of the riprap is a variable-width and gentle-to-moderate sloping sandy beach approximately 10 to 30 m (33 to 100 ft) in width. A rocky intertidal habitat lies seaward of this stretch of sandy beach. The beach at the Linda Lane locale is backed by a stone revetment to the north and an access road to the south. It is also fronted by a steeply sloping sandy beach to the water line. There is also a rock riprap that protects the lifeguard headquarters from wave run up in front of buildings along this section of the shoreline.

Common benthic invertebrates observed on southern California sandy beaches between the low and high tide marks include sand crabs (*Emerita analoga*), beach hoppers (*Orchestoidea* spp.), burrowing polychaete worms, amphipods, isopods, and clams.

The offshore benthos in the shallow subtidal are expected to be similar to species that are common to north San Diego County, which is also part of the SCB and

approximately 40 km (25 mi) from the project area. Subtidal invertebrates commonly observed in San Diego County that are likely to be found in the project area include tube-dwelling polychaete worms (e.g. *Diopatra* spp., *Loimia medusa*, *Pista pacifica*), sand dollar (*Dendraster excentricus*), crabs (*Heterocrypta occidentalis*, *Portunis xantusii*, *Randallia ornata*), hermit crabs (*Pagurus* spp., *Pagurites* spp.), marine snails (*Nassarius fossatus*, *Olivella biplicata*, *Polinices* spp.), clams (*Ensis* spp.), armored sea star (*Astropecten armatus*), tube anemones (*Harenactis attenuata*, *Zaolutus actius*), sea pens (*Stylatula elongata*), and sea pansies (*Renilla kollikeri*) (MEC Analytical Systems, Inc. (MEC), 2002; Thompson et al., 1993).

The number of species and density of bottom dwelling macroinvertebrates is expected to be low in the area of potential offshore borrow sites, which will most likely be within the inner shelf zone. Infaunal abundance and diversity is generally low in the inner shelf compared to the middle and outer shelf because the inner shelf zone is regularly disrupted by wave activity and oceanic swell (SANDAG, 2000). Polychaete worms and/or small, mobile crustaceans typically dominate the inner to middle shelf infaunal communities of the SCB (SANDAG, 2000).

Fish species that occur within the study area are expected to be similar to those found in San Diego County. Fish commonly found over sandy subtidal habitat (less than 9 m or 30 ft) off of San Diego County beaches include California halibut (*Paralichthys californicus*), speckled sanddabs (*Citharichthys stigmaeus*), barred surfperch (*Amphistichus argenteus*), white croaker (*Genyonemus lineatus*), bat ray (*Myliobatus californica*), and shovelnose guitarfish (*Rhinobatos productus*) (MEC 2002, SANDAG 2000). Northern anchovy (*Engraulis mordax*), jack mackerel (*Trachurus symmetricus*), Pacific bonito (*Sarda chiliensis*), and topsmelt (*Athernops affinis*) are commonly encountered in the water column just beyond the surfzone (MEC, 2002; SANDAG, 2000). Flatfish, including speckled sanddab, horneyhead turbot (*Pleuronichthys verticalis*), and fantail sole (*Xystreurys liolepis*), are more common at deeper inner shelf depths ranging from –10 to –24 m (-30 to –80 ft) MLLW (MEC, 2002).

The sandy beach area in proximity of the Linda Lane Beach environs is a potential grunion spawning area, although recent successful spawning has not been reported (CRM, 2000). California grunion (*Leuresthes tenuis*) is fish that are associated with many beaches in southern California. Grunion lay their eggs in the wet beach sands during the highest spring tides between late February or early March, to as late as early September (Walker, 1952). The eggs incubate a few inches deep in the sand and hatch approximately 10 days later during the next series of high tides (Chambers Group, Inc., 2002). San Clemente beaches are not actively used by grunion as a spawning site based on interviews with San Clemente lifeguards working the beaches for the last 30 years (Lynn Hughes, City of San Clemente, pers. com August 19, 2000).

3.3.1.2.2 Hard Substrate Communities

Environs at Mariposa Point are substantial sensitive rocky intertidal habitat, which supports a relatively diverse invertebrate community on individual boulders as well as on the surfaces of the low-lying platform reefs (CRM, 2000). The high intertidal or splash zone is characterized by barnacles (*Cthamalus* spp.), limpets (*Lottia* spp., *Collisella* spp.), and periwinkle snails (*Littorina* spp.) (MEC, 2002). The California mussel (*Mytilus californianus*), aggregating anemone (*Anthopleura elegantissima*), giant green anemome (*A. xanthogrammica*), chitons (*Mopalia muscosa* and *Nuttallina californica*), barnacles (*Balanus* spp.), hermit crabs, and snails (*Acanthina* spp.) are commonly observed throughout the middle and low intertidal zones (CRM, 2000; MEC, 2002). Although not common, the reef-building sandcastle tube worm (*Phragmatopoma californica*) was also found around the base of several boulders in the middle intertidal zone (CRM, 2000). The low intertidal zone and the adjoining subtidal rocky habitat, including the apex of the offshore reefs, support a diverse assemblage of invertebrate species. Typical reef organisms observed during the CRM June 2000 survey included mussels (*Mytilus californianus* and *M. edulis*) gorgonians (*Muricea californica* and *M. fructicosa*), keyhole limpet (*Megathura crenulata*), purple and red sea urchin (*Strongylocentrotus purpuratus* and *S. franciscanus*), California sea cucumber (*Parastichopus californicus*), Kellet's whelk (*Kelletia kelletii*), and sea stars (*Pisaster brevispinus* and *P. giganteus*). Other species expected to occur include the California sea hare (*Aplysia californica*), as well as various crabs and marine snails (MEC, 2002).

Up to ten species of fish utilize the low to minus tidal zones of rocky intertidal habitats in the SCB (MEC, 2002). Wooly sculpin (*Clinocottus analis*) is one of the more commonly encountered fish species in tidepools, but juvenile opaleye (*Girella nigricans*), rockpool blenny (*Hypsoblennius gilberti*), spotted kelpfish (*Gibbonsia elegans*), and California clingfish (*Gobiesox rhessodon*) may also be present (Cross and Allen, 1993).

A survey conducted in June 2000 by CRM of the nearshore reefs within the project area identified spotted sand bass (*Paralabrax maculofasciatus*), kelp bass (*P. clathratus*), senorita (*Oxyjulius californicus*), bat ray, and black surfperch (*Embiotoca jacksoni*). Other fish that are commonly associated with nearshore reef habitats with developed stands of perennial vegetation above one meter (3 ft) in height may also be present within the project area, including barred sand bass (*P. nebulifer*); shiner, walleye, and dwarf surfperches (*Embiotocidae*); California sheephead (*Semicossyphus pulcher*); garibaldi (*Hypsypops rubicundus*); jack mackerel (*Trachurus symmetricus*); giant kelpfish (*Heterostichus rostratus*); painted greenling (*Oxylebius pictus*); and halfmoon (*Medialuna californiensis*) (MEC, 2002; Thompson et al., 1993). The dominant fish species in the offshore kelp beds, 650 m (2,000 ft) offshore of Mariposa Point (Washrock Reef) and 1220 m (4,000 ft) from North Beach at depths between –7 to –8.5 m (-23 to -28 ft) MLLW, are expected to be surfperch (*Embiotocidae*); rockfish (*Sebastes* spp.); and wrasses (*Labridae*) (e.g. sheephead, senorita, and rock wrasse (*Halichoeres semicinctus*)).

3.3.1.3 Essential Fish Habitat

[To be provided by USACE in F4]

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, an assessment of Essential Fish Habitat (EFH) may be conducted for the proposed project. The project is located within an area designated as EFH for two Fishery Management Plans (FMPs): Coastal Pelagic Species Fishery Management Plan and Pacific Coast Groundfish Fishery Management Plan. Many of the 86 species federally managed under these plans are known or expected to occur in the area and could be affected by the proposed project.

The USACE will determine if the proposed project will result in any significant, adverse impacts to any species on the Fishery Management Plan or their habitat.

3.3.1.4 Birds

A diverse variety of resident and migratory seabirds and shorebirds are commonly observed along southern California beaches and offshore waters. Seabirds such as pelicans, terns, and cormorants forage for fish in the Nearshore Ocean. Sandy upper tidal beaches are utilized by gulls and shorebirds as roosts. Gulls feed on fish and invertebrates, particularly near the edge of the kelp canopy. Shorebirds probe for invertebrates in the damp sands of the middle and low intertidal zones, and some species also forage for small fish and invertebrates in the rocky intertidal. Kelp and surfgrass that have washed ashore harbor invertebrates and, thus provide good foraging areas for gulls and shorebirds.

The seabirds that are most commonly observed along the beaches and ocean waters offshore of Orange and San Diego Counties include Heerman's gull (*Larus heermanni*), ringed-billed gull (*L. delawarensis*), western gull (*L. occidentalis*), California brown pelican (*Pelecanus occidentalis californicus*), surf scoter (*Melinita perspicillata*), terns (*Sterna* spp.), grebes (*Podicipedidae* spp.), double-crested (*Phalacrocorax auritus*), Brandt's (*P. pencillatus*), and pelagic (*P. pelagicus*) cormorant (Chambers Group, 2002; MEC, 2002). Commonly observed shorebirds include black turnstone (*Arenaria melanocephala*), marbled godwit (*Limosa fedoa*), sanderling (*Calidris alba*), whimbrel (*Numenius phaeopus*), willet (*Catoptrophorus semipalmatus*), dunlin (*Calidris alpina*), western sandpiper (*Calidris mauri*), and least sandpiper (*Calidris minutilla*) (Chambers Group, 2002; McConnaughey and McConnaughey, 1988; MEC, 2002).

3.3.1.5 Marine Mammals (Non-Endangered)

The marine mammals that occur in the Southern California Bight have been described in detail in previous studies and environmental documents (e.g., Bonnell et al., 1981; 1983; Bonnell and Dailey, 1993; Dohl et al., 1981; 1983; ADL, 1984; Barlow, 1995; Barlow et al., 1995, 1997; Barlow and Gerrodette, 1996; Koski et al., 1998; FWS, 2000; DeLong and Melin, 2000; Stewart and Yochem, 2000). Although as many as 34 species of marine mammals inhabit or visit the Southern California Bight, including 6 species of pinnipeds (seals and sea lions), 27 species of cetaceans (whales, porpoises,

and dolphins), and the sea otter, only about 4 species are expected to occur in the nearshore waters of the study area off San Clemente on a regular basis. These include 2 pinnipeds, 1 whale, 1 porpoise, and 1 dolphin. Other species may also occasionally occur in the study area on an irregular basis.

Pinnipeds. Two species of pinnipeds, the California sea lion (*Zalophus californianus*) and the harbor seal (*Phoca vitulina*), are expected to occur in the study area. The California sea lion ranges from British Columbia to Mexico. The current U.S. population size is estimated at 204,000-214,000 animals (Forney et al., 2000). In the Southern California Bight, California sea lions currently breed on four islands: San Miguel, San Nicolas, Santa Barbara, and San Clemente.

Harbor seals range from Mexico to the Aleutians. The North Pacific population is centered in Alaska (Hoover, 1988), and about 30,000 harbor seals are found in California (Forney et al., 2000). Peak harbor seal populations on land occur during the species' spring breeding and pupping season and early summer molt.
Harbor seals appear to forage relatively close to shore.

Gray Whale. The gray whale (*Eschrichtius robustus*) migrates through southern California waters twice a year on its way between Mexican breeding lagoons and feeding grounds in the Bering Sea. The southbound migration of gray whales through the Southern California Bight begins in December and lasts through February; the northbound migration is more prolonged, lasting from February through May with a peak in March (Leatherwood, 1974; Bonnell and Dailey, 1993). Gray whales are generally absent from southern California waters from August through November. Migrating gray whales generally travel within 3 km of the shoreline over most of the route.

Bottlenose Dolphin.
There are two California populations of bottlenose dolphins, coastal and offshore. Coastal bottlenose dolphins, which are the population that is most likely to occur in the study area, generally are found within a kilometer or two of shore, primarily from Point Conception south into Mexican waters. The coastal population appears to form small resident groups that range along the coastline, especially off Orange and San Diego counties (Weller and Defran, 1989). Forney et al. (2000) estimated the coastal population at about 170 animals.

3.3.2 Terrestrial Shoreline Habitat

3.3.2.1 Vegetation

Residential and commercial development, a train railway, recreational activities, and introduced non-native, exotic plants have largely eliminated native terrestrial vegetation along the San Clemente shoreline and adjacent upland areas. The beach area is heavily used for recreation and upland vegetation is limited primarily to ornamentals and a few patches of native vegetation. The vegetation is typified by common non-native

species such as iceplant (*Lampranthus* spp.), sea rocket (*Cakile maritima*), African daisy (*Gazania* spp.), and mature palm trees. These sandy beach back bluffs are outside the project area. The San Clemente project study boundary does not include any of the terrestrial vegetation types east of the railroad tracks and therefore are omitted from further analysis.

3.3.2.2 Wildlife

Wildlife species within the project are typical of the highly disturbed, heavily utilized sandy beach habitat. Of unique wildlife sensitivity and value is the rocky outcrop intertidal landscape present at Mariposa Point north of the San Clemente Pier.

3.3.3 Threatened and Endangered Species

Section 7(c) of the Endangered Species Act (ESA), as amended, requires that a federal agency request from the appropriate authority a list of threatened and/or endangered species present in an area of a proposed major federal action. Letters requesting this information were sent to the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) dated December 3, 2001, (Appendix ??). Responses dated February 12, 2002 (NMFS), and March 12, 2002 (FWS), provided species lists. NMFS indicated that no threatened and endangered species under their jurisdiction are expected to occur in the study area. FWS indicated that two threatened and endangered fish; the tidewater goby (*Eucyclogobius newberryi*) and the southern steelhead (*Oncorhynchus mykiss*); three threatened and endangered birds, the California brown pelican (*Pelecanus occidentalis*), the California least tern (*Sterna antillarum browni*), and the western snowy plover (*Charadrius alexandrinus nivosu*); and one mammal, the Pacific pocket mouse (*Perognathus longimembris pacificus*) may occur in the study area.

CONSIDER USING TABLE FOR INFO BELOW [Additional details to be provided in F4]

3.3.3.1 Tidewater Goby (Federal Endangered)

The tidewater goby (*Eucyclogobius newberryi*) was listed as endangered on February 4, 1994 (59 FR 5498). A recovery plan has not been approved for this species at this time. FWS has proposed delisting the tidewater goby north of Orange County. Gobies are mostly coastal lagoon fishes that prefer shallow, usually brackish water (Love, 1996). Primary tidewater goby habitat is found in small, shallow coastal lagoons that are separated from the ocean most of the year by beach barriers. This includes shallow areas of bays and areas near stream mouths in uppermost brackish portions of larger bays. The Fish and Wildlife Service designated critical habitat for the tidewater goby on November 20, 2000 (65 FR 69693-69717). Critical habitat includes stream channels and their associated wetlands, flood plains, and estuaries. Within or near the San Clemente project area, populations of tidewater gobies, although highly variable in number, occur at San Mateo Creek and San Onofre Creek.

3.3.3.2 Steelhead Trout (Federal Endangered)

The effective date for listing the Southern California Evolutionarily Significant Unit (ESU) of west coast steelhead (*Oncorhynchus mykiss*) as endangered and the South-Central California Coast ESU as threatened is October 17, 1997 (63 FR 32996). Steelheads from the Southern California ESU have already been extirpated from much of their historical range. There is a strong concern about the widespread degradation, destruction, and blockage of freshwater habitats within the region, and the potential results of continuing habitat destruction and water allocation problems. Total abundance of steelhead in the South-Central Coast ESU is extremely low and declining. Risk factors for this ESU are habitat deterioration due to sedimentation, and flooding related to land management practices.

Estimates of historical (pre-1960s) abundance are available for several rivers in this ESU: Santa Ynez River, before 1950, 20,000-30,000; Ventura River, pre-1960, 4,000-6,000; Santa Clara River, pre-1960, 7,000-9,000; Malibu Creek, pre-1960, 1,000. In the mid-1960s, the California Department of Fish and Game (CDFG) estimated steelhead-spawning populations for smaller tributaries in San Luis Obispo County to be 20,000, but they provided no estimates for streams farther south.

Steelheads, like all salmon, need clean, cool water with plenty of oxygen and low amounts of suspended solids and contaminants. They also need gravel and rocks to spawn. Fine sediment is lethal to steelhead. Steelheads also require large, woody debris and deep pools in the river, which provide refuge from predators and resting places during storms. In the vicinity of the San Clemente project area, steelhead occur in San Mateo Creek, although this area has not been designated as critical habitat at the present time. Historically, San Mateo Creek was one of the most productive streams for southern steelhead. In a report to NOAA National Marine Fisheries Service (NMFS), the U.S. Marine Corps Base, Camp Pendleton (MCBCP) in coordination with the California Department of Fish and Game (CDFG) determined that San Mateo Creek (*Reach 1*) in northern San Diego County still supports a small population of the southern California steelhead. This is based upon field surveys completed in 2003 by biologist from MCBCP and CDFG (S. Glowacki pers. Comm. 2004). Even though this steelhead population is relatively small, large adults ware found. Furthermore, steelhead have also been observed and found in the San Juan Creek/Trabuco Watershed, on San Juan Creek (Reach 10). This is also a small population (S. Glowacki pers. Comm. 2004). [Additional details to be provided in F4]

3.3.3.3 Brown Pelican (Federal and State Endangered)

The California brown pelican was listed as endangered on October 13, 1970 (35 FR 8320) and state listed as endangered June 27, 1971. To date, no critical habitat has been designated for this species. A recovery plan for this species was finalized in 1983 (FWS, 1983). Most of the pelicans seen foraging off the coast of California are usually

within 10 nautical miles of the coast. Roost sites are considered essential habitat for this species. Roosting habitat includes offshore rocks and islands, river mouths with sand bars, breakwaters, pilings, jetties, and estuaries (FWS, 1983). Pelicans usually return to specific coastal roosts each day (usually by late afternoon, but sometimes not until several hours after sunset) and do not normally remain at sea overnight. Night roosts are usually in regions with high oceanic productivity and isolated from predation pressure and human disturbance. Pelicans may also periodically return to land during the day to rest, but requirements for daytime roosts are less restrictive, and these roosts are more numerous and usually much smaller than night roosts (Briggs et al., 1983; Jacques and Anderson, 1987). Although pelicans occur in the study area and a few roost in the area (e.g., the San Clemente Pier), based on Jaques and Anderson's research (1987) and Jaques et al (1992) there are no major pelican roosts in the study area.

After the breeding season, pelicans begin to disperse along the Pacific coast. The population numbers of brown pelicans is variable from year to year but it is with reach of Recovery Plan goals.

(NOTE: Discuss disturbance results from Mugu Lagoon publication in relation to San Clemente Project). BRPE day/night roost information as well as disturbance reports from Jaques et al 1999 – 2002; correct in F4 phase

3.3.3.4 California Least Tern (Federal and State Endangered)

The California least tern was listed as endangered on October 13, 1970 (35 FR 16047) and state listed as endangered on June 27, 2004. A recovery plan for the species was published in 1980 (FWS, 1980b), and has since revised the 1980 recovery plan, however, the FWS will not release the report or its contents. Critical habitat was never designated. The breeding range of the California least tern population occupies specific localized breeding colonies from about April to September each year. Colonies are usually in close proximity to lagoons or estuary or river confluences with the ocean environs where they obtain most of the small fish they consume, although they may also forage up to 2-3 miles from the nearshore environment. The nearest known nesting colony is approximately 12 miles south of the southern boundary of the project site at San Mateo Point on the Camp Pendleton Marine Corps Base.

Least terns are known to use the near shore waters for foraging as they make their northbound and southbound migration treks. A field reconnaissance on April 8, 2004, indicated there were several least terns (<10 birds) moving northward along the San Clemente coastline within the study are boundary.

There are no known records of least terns do not use the San Clemente sandy beach habitat for nesting or for night roosts. The population's status is Correct in F4 phase

3.3.3.5 Western Snowy Plover (Federal Threatened)

The coastal population of the western snowy plover was listed as threatened in the Federal Register on March 5, 1993 (58 FR 12864). A recovery plan for the species has been completed. Designation of critical habitat was published in the Federal Register on December 7, 1999 (64 FR 68507). This population is defined as those individuals that nest adjacent to tidal waters, and includes all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries, and coastal rivers. The breeding range of the threatened population extends along the Pacific coast of North America from southern Washington to southern Baja California, Mexico. The winter range is somewhat broader and may extend to Central America (Page et al., 1995); most plovers winter from California south, however.

The nesting habitat of the coastal population is mainly dune-backed beaches, barrier beaches, salt flats, and salt evaporation ponds. Habitat of wintering birds includes beaches where nesting is not known to occur. In the U.S., over 150 currently used or historical nesting and/or wintering areas have been identified), most of which (about 85 percent) are in California. All primary constituent elements of snowy plover nesting habitat are not present within the 5 miles of the project area, thus snowy plovers do not nest within the project area. There is no listed critical habitat for the snowy plover within the project area or within Orange County or North San Diego County. The coastal population consists of both resident and migratory birds. Some birds winter in the breeding areas, while others migrate north or south to wintering areas. Current population data for California is 1,444 adult plovers (Ruane 2004, personal communications).

Although plovers may use the beaches within the San Clemente project area during the winter months and during migration, nesting plovers does not use these beaches. There have been limited, anecdotal observations of snowy plovers during the winter within the study boundary area, however, this continues to be a data gap for the FWS (K. Clark and L. Hays, pers comm. 2004).

3.3.3.6 Pacific Pocket Mouse (Federal Endangered)

The Pacific pocket mouse was listed as endangered on September 29, 1994 (59 FR 49752). A recovery plan for the species was published in 1998 (U.S. Fish and Wildlife Service (FWS), 1998), but critical habitat has not been designated. The historical range of the mouse extends from Los Angeles County to southern San Diego County (FWS, 1998). The species is currently known from only a few sites, the Dana Point Headlands in southern Orange County and three sites in northern San Diego County. The sites in San Diego County are located 0.9 mi, 1.3 mi, and 1.6 mi from the coast, respectively. The habitat of this mouse is limited to fine-grained sandy soils in coastal sage scrub, coastal strand, coastal dunes, and river alluvium within 2.5 mi of the coast (FWS, 1998). Little is known of the breeding biology of Pacific pocket mice (FWS, 1998). Breeding appears to occur from about April through June. Hibernation occurs from September through March.

Although the species was historically limited to the coast of southern California, it was much more widespread historically. Presently, the species is limited to only four known sites in southern Orange County and northern San Diego County (FWS, 1998). The total population of this species is probably less than 200 individuals. In the vicinity of the San Clemente project area, Pacific pocket mice occur to the north at Dana Point and just south of the project area, near San Mateo Creek. However, the populations near San Mateo Creek are well outside the project area, being (0.9 to 1.3 mi) inland from the beach.

It is not known if pacific pocket mice are found at the San Clemente State Park located east of *Reach 3* or in the open bluff habitat west of San Mateo Point within *Reach 1*. Additional details to be provided in F4]

3.4 Cultural Resources

3.4.1 Regulatory Setting

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on cultural resources eligible for the National Register of Historic Places (NRHP). Under the NHPA, cultural resources are referred to as historic properties. Historic properties include districts, sites, buildings, structures, and/or objects. Historic properties are located and identified by conducting a records and literature search and performing a systemic archaeological pedestrian survey of the area of potential effects (APE). Once a historic property has been located and identified by a qualified archaeologist, it undergoes an evaluation process to determine its eligibility for listing on the NRHP.

To be eligible for inclusion in the National Register properties ordinarily must be at least 50 years old (unless they are exceptionally significant), and must be important in American history, architecture, and/or engineering at the national, state, or local level. In addition, historic properties must possess integrity of location, design, setting, materials, workmanship, feeling, association, and meet at least one of the four following criteria:

(a) Associated with events that have made a significant contribution to the broad patterns of our history,
(b) Associated with the lives of persons significant in American history,
(c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction (as in a district), and
(d) Have yielded, or may be likely to yield, information important in prehistory or history (National Register of Historic Places, 36 CFR 60.4).

If a historic property, located within the APE, is determined eligible for the NRHP by the agency in concurrence with the State Historic Preservation Officer (SHPO); then, the proposed federal action is required to undergo Section 106 review in order to be in

compliance with the NHPA. The Section 106 process involves consultation with the SHPO, the federal Advisory Council on Historic Preservation (ACHP), and other interested parties, including Native American Tribes. The steps in this process include the following: (1) defining, in consultation with the SHPO, the APE, designing appropriate procedures to inventory and evaluate historic properties, and identifying appropriate consulting and interested parties, (2) inventorying and evaluating the National register eligibility of historic properties that may be affected by the proposed federal action (as explained above), (3) assessing the potential effect of the undertaking on National Register eligible historic properties, (4) if appropriate, consulting with the SHPO and other interested parties to determine ways to avoid or reduce the impacts of the proposed federal action on National Register eligible historic properties, and (5) if necessary, proceeding with the undertaking under the terms of a Programmatic Agreement (PA) or Memorandum of Agreement (MOA). PAs and MOAs are filed with the ACHP. At any time during the Section 106 process, the ACHP may determine their level of involvement on a project-by-project basis.

3.4.2 Culture History

This section summarizes the archaeology within and adjacent to the southern California coastline from Doheny State Beach to San Mateo Point. A variety of different regional chronologies, often with overlapping terminology, have been used in coastal southern California and they vary from region to region. Today, the prehistory of Orange County is generally divided into three major temporal periods: Paleoindian, Archaic, and Late Prehistoric. These time periods are characterized by patterns in material culture that are thought to represent distinct regional trends in the economic and social organization of prehistoric groups. In addition, particular scholars referring to specific areas utilize a number of cultural terms synonymously with these temporal labels. For example, Warren (1968) in reference to the southern California coast and specifically Orange County prefers Encinitas Tradition for Archaic and Shoshonean for Late Prehistoric.

3.4.2.1 Paleoindian Period

The antiquity of human occupation in the New World has been the subject of considerable debate over the last few decades. The currently accepted model is that humans first entered the western hemisphere between 12,000 and 15,000 years B.P. There is currently no firm evidence of human occupation in coastal southern California prior to 12,000 B.P. Thus, this period begins with the first evidence of human occupation and ends with the extinction of Pleistocene game around 9,000 B.C. No Paleoindian period sites are known within Orange County, but several have been found in San Diego County. Warren (1968) named this local cultural tradition the San Dieguito Tradition. The artifact assemblage for this period consists mostly of lithic (stone/rock) artifacts: large projectile points, scrapers, and choppers. Paleoindian subsistence was based on the hunting of large Pleistocene game. Social groups/families would have stayed with a major kill as until it was depleted of all its nutritional and functional value. Researchers argue that such an economy could only support groups no larger than

extended families. Around 9,000 B.C. the Pleistocene Epoch ended and the large game animals became extinct. No longer able to continue their big game hunting tradition, the Paleoindian was forced to utilize other resources to meet their economic needs.

3.4.2.2 Archaic Period

The Archaic period is commonly subdivided into Early (9,000-6,000 B.C.), Middle (6,000-4,000 B.C.), and Late Archaic period (4,000-2,000 B.C.). In addition, Wallace (1955) refers to this as Horizon II Milling Stone and Warren (1968) calls it the Encinitas Tradition. Subsistence during the Early Archaic came primarily from plants and small animals, fishing, and shellfish. By the Middle Archaic, hard seeds were included in the diet as evidenced by the abundance of manos and metates found within these sites. By the Late Archaic, social groups grew in numbers and became more sedentary. Groups migrated seasonally depending on food availability rather than randomly following game animals.

3.4.2.3 Late Prehistoric Period

The Late Prehistoric period is generally considered to have begun between 1300 and 800 years ago (Moratto 1984). In general, this period has been characterized by the appearance of small pressure flaked arrow points (Cottonwood Triangular and Desert Side-notched points) indicative of bow and arrow technology, the appearance of ceramics, the replacement of flexed inhumations with cremations, the possible appearance of the mortar and pestle, and an emphasis on inland plant food collecting and processing, especially of acorns. In addition, sedentary villages with populations of up to 1500 persons along with decorated tools and ornaments are attributed to this period. Warren (1968) called this period Shoshonean. Named after the migration of Shoshonean-speakers, known as the Shoshonean wedge, to mostly what is now Orange County from the inland deserts about 1,500 years ago. Researchers have attributed this migration to the origin of the Late Prehistoric period. Following this influx of new people, the tribal landscape in the Southern California Coastal regions was altered by differentiation of tribes into the discrete cultural groups that were present at the time of European contact (Wallace 1955).

3.4.2.4 Post-Contact Native American Ethnohistory

The Post-Contact period began in A.D. 1769 when Gaspar de Portola led an overland expedition from San Diego to Monterey, CA. The first permanent settlement in Orange County came when San Juan Capistrano was selected as the site for a Mission in the spring of 1775. The establishment of the San Juan Capistrano Mission in 1776 and the San Luis Rey de Franciscan Mission in 1798 further impacted traditional coastal settlement systems. Acculturation, assimilation, and the introduction of Old World diseases greatly disrupted and reduced Native American populations, and by the early 1800s traditional coastal villages were largely abandoned.

This project area falls primarily within the territory of the Juaneño Tribe. They are known as the Juaneño because of their association and proximity with the San Juan Capistrano Mission. According to Bean and Shipek (1978), the Juaneño and Luiseño are considered to be ethnologically and linguistically the same, but have been subdivided due to missionization during the Spanish period. Today, the Juaneño Indians have distinguished themselves by gaining State recognition and seeking Federal recognition as a discrete Indian tribe.

Our knowledge of California Indian life prior to European contact is based mostly on knowledge based from archaeological investigations. Since California tribes were generally peaceful and did not offer warlike resistance to European settlers, they did not receive the notoriety more aggressive groups enjoyed. In addition, consequently American researchers became interested in Indian ethnohistory only after their pre-contact cultural traditions and languages were virtually destroyed. As a result, we know very little about traditional coastal life, except what can be gleaned from mission records. Nineteenth and Twentieth century ethnohistoric reconstructions provide only minimal insight into coastal adaptations.

Father Boscana's "*Chinigchinich*" is, in the words of Kroeber, "the most intensive and best written account of the customs and religion of any group of California Indians in the mission days" (1925:636). The Juaneño practiced puberty rites and mourning rituals. Both these ceremonies were held within a sacred, enclosed structure called the *Wankech*. Uninitiated persons were not allowed to enter this structure and once inside voices were kept to a whisper. The structure contained an altar consisting of an effigy of the god *Chingichnich* and a sand painting. According to Brown, "the center of the Juaneño religion was *Chinigchinich*, the last of a series of heroic mythological figures. The heroes were originally from the stars and the sagas told of them formed the Juaneño religious beliefs" (1997).

Puberty rites were practiced for both boys and girls. Male initiation included the use of datura, a hallucinogen, in order to "see" the animal that would help protect them from future dangers. The animal was usually a coyote, bear, crow or raven, and a rattlesnake. Female initiation required that the girl fast and lay in a pit lined with heated stones for several days while older women sang and younger women danced around her. The mourning ceremony consisted of cremating the decedent usually just hours after death. The pyre was lit by a designated individual who obtained this privilege by decent. The Juaneño had medicine men or shamans, but very little is known about them or their practices. In addition, the Juaneño used a calendar. According to Kroeber, "ten months were named…the year was definitely divided by the solstices…the month or moon in which the solstice fell was somewhat longer than the others, after which there followed four regular lunations…nothing like this attempt to combine a lunar and solar count has yet been reported from any other people in California" (1925:644). The office of Chief was inherited from paternal lineage.

3.4.2.5 Euro-American History

The Hispanic era in California's history includes the Spanish Colonial (1769-1820) and Mexican Republic (1820-1846) periods. This era witnessed the transition from a society dominated by religious and military institutions consisting of missions and presidios to a civilian population residing on large ranchos or in pueblos. The effects of missionization, along with the introduction of European diseases, greatly reduced the Native American population of southern California.

By the early 1820s, California came under Mexico's rule, and in 1834 the missions were secularized. This resulted in political imbalance and Indian uprisings against the Mexican rancheros. Secularization of mission lands began shortly after the declaration of Mexican Independence in 1821. Nine thousand acres of land, including the area of San Clemente, were granted to Filipe Carrillo in 1846 as Rancho Los Desaechos (Brown 1997). Carrillo failed to submit his claim to the U.S. Land Commission after the United States took possession of the area from Mexico and as a result the rancho changed hands several times (Brown 1997).

Named after one of the offshore southern Channel Islands, San Clemente Island, the city was founded by a former mayor of Seattle, Ole Hanson, in 1925 (Brock 1985). San Clemente was among the first master planned communities built from totally open land in the United States. Before erecting a single structure on the rolling coastal hills, Ole Hanson laid out an expansive plan based on the Spanish Colonial architectural style including restaurants, a clubhouse, residences, public parks, a public pool, a fishing pier, and even equestrian trails. Hanson's residential community, promoted as "The Spanish Village," featured wide, meandering streets that conformed to the contours of the hills, houses situated to provide an ocean view, and mandatory white stucco exteriors and red tile roofs for every building. San Clemente was incorporated in 1928, and grew rapidly until the Depression, when development halted. The growth rate picked up again during the 1950s, and was later boosted by construction of the San Diego Freeway.

Today, the Spanish Village by the Sea is more heterogeneous than Hanson had envisioned, but historic homeowners and current planning and development all reflect increasing esteem for his red-roofed, white-walled Spanish architecture dream. Historic homeowners must abide by city codes that protect the aesthetic spirit and style of early San Clemente. New development east of the 5 freeway now elevates Spanish Colonial Revival architecture to new interpretations, incorporating red roofs, balconies, and promenades as the demographics of San Clemente shift and new residents are drawn to the Mediterranean charm of this community. Perhaps the best example of San Clemente's increasing appreciation for its past is the restoration underway at the Casa Romantica, which was Ole Hanson's bluff top home at the time of the City's founding. The Casa Romantica was completed in 1928, and after Hanson lost it to the bank during the Great Depression, the Casa passed through various owners. The wear and tear of time and neglect took its toll and at one point the outstanding landmark seemed

destined for demolition. Fortunately, a group of local activists pushed hard for the Casa Romantica's rescue, and directed its destiny away from commercial alternatives and toward a use that will benefit all of the community—that of a Cultural Center and Gardens.

3.4.3 Records and Literature Search Results

A records and literature search was completed at the South Central Coastal Information Center at California State University, Fullerton to determine if prehistoric or historic sites had been previously recorded within the project area. While no sites have been recorded within the project area, three shell middens and an isolate have been recorded adjacent to the project's eastern boundary (Table 3.4.3). In addition, the Historic Resources Inventory (HRI), which includes the National Register (NR), California Register, State Historic Landmarks, Points of Historic Interest and all properties evaluated for the NR, identified two properties located in the project vicinity: Casa Romantica and San Clemente Beach Club.

No recorded archaeological sites or historic properties have been recorded within the project area.

Table 3.4.3. Summary of Recorded Archaeological Sites

Site No.	Description	Source/Date
CA-Ora-101	Shell midden	Smethe 1954
CA-Ora-102	Shell midden, village site, manos	Waldeck 1948
CA-Ora-103	Shell midden, hammerstone, manos	Waldeck 1948
Update	Bulldozer removed most of site	Smith 1953
30-100074	Basalt denticular flake (Isolate)	Maxon 1996

Reach 1

No sites recorded.

Reach 2

No sites recorded.

Reach 3

No sites recorded.

Reach 4

No sites recorded.

Reach 5

No sites recorded.

Reach 6

Casa Romantica, added to the National Register of Historic Places in 1991, #91001900.

Reach 7

No sites recorded.

Reach 8

No sites recorded.

Reach 9

San Clemente Beach Club, added to the National Register of Historic Places in 1981, #81000164,

Reach 10

No sites recorded.

3.4.4 Discussion

The project area has been extensively disturbed by urban development. The above listed archaeological and historical sites will not be impacted by the proposed project. Because the southern California coast is rich with cultural history, discovery of buried sites is always a possibility. If cultural resources are located, the Corps must be notified immediately.

3.4.5 Field Survey

As soon as a preferred and feasible alternative is selected, an archaeological survey of the area of potential effects (APE) will be conducted to locate unrecorded and undiscovered cultural resources on land. In addition, since the project area extends offshore, remote sensing surveys will be used to locate underwater sites.

3.4.6 Section 106 Consultation and Coordination

In accordance with 36 CFR 800.3 an initial letter will be sent to the California State Historic Preservation Officer (SHPO) and Native American Tribes within Orange County advising them of this proposed project and present findings. The next phase of this

project will involve the selection of a preferred alternative. As soon as the preferred alternative is selected and the area of potential effects is surveyed, letters will be sent to SHPO and Tribes advising them of our determinations.

3.4.7 No Action Alternative

Under the No Action Plan cultural resources would not be impacted, positively or negatively, if the proposed project does not take place.

3.5 Aesthetics

The project is studying various alternatives proposes in protecting the San Clemente shoreline region, existing beaches, which are located in the Coastal Visual Resource Zone. The program is consistent with Policy 10.2.5 of the City of San Clemente General Plan Natural and Historic/Cultural Resources Element, which promotes development of programs "that will preserve and maintain the physical features of the coastal zone including bluffs, canyons, and beaches." Views to the west of the entire San Clemente shoreline region are of the Pacific Ocean.

With the exceptions of Pacific Ocean views, the central portion, and a southern area along the San Clemente shoreline region of the project area, the view shed is generally disturbed partly due to residential development. Conversely, the central portion of the project area includes agricultural areas, while the southern area has a portion that is vacant and generally devoid of human development and consists mainly of natural views.

3.6 Air Quality

The air quality analysis has been performed for the proposed project by using guidelines provided by the CEQA handbook, AQMD 1993. Information on equipment and construction workers is based on past and current ongoing projects. The Project area is located within the South Coast Air Basin (SCAB), which encompasses all of Orange County, most of Los Angeles and Riverside Counties, and the western portion of San Bernardino County. Air quality in the project area is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is responsible for achieving air quality goals within the South Coast Air Basin.

Located near the Pacific Ocean, the proposed project area experiences mild Mediterranean climate. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a ridge over the cool marine layer, which prevents pollution from dispersing upward. This inversion forces pollutants to accumulate within the lower layer. Because of the low average wind speeds in the summer and a persistent daytime temperature inversion, emissions of hydrocarbons and oxides of nitrogen have an opportunity to combine with

sunlight to produce smog. Prevailing winds blow from the southwest at an average speed of 3.4 miles per hour while precipitation primarily falls between October and April, with an average annual rainfall of approximately 14 inches.

Air quality in the United States is governed by the Federal Clean Air Act (CAA) and is administered by the United States Environmental Protection Agency (USEPA). In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA).

The SCAQMD and the California Air Resources Board (CARB) maintain a network of air quality monitoring stations within the basin. The stations monitor the surrounding air for the presence of ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), suspended particulate matter (PM_{10}), lead (Pb), sulfate (SO_4), and nitrate (NO_3). Excepting nitrate, these are pollutants for which the State and Federal governments have established air quality standards and, in some cases, episode criteria.

The South Coast Air Basin remains a non-attainment area under the federal clean air act for all State and Federal ambient air standards except lead and sulfur dioxide. Ozone and particulate standards are exceeded throughout the Basin, carbon monoxide standards in about one-fourth of the Basin, and nitrogen dioxide and sulfate standards only in small or scattered portions of Los Angeles. The SCAQMD samples ambient air at 32 monitoring stations in and around the South Coast Air Basin.

The Air Basin has exceeded Federal and State standards for ozone, CO, NO_2, and PM_{10}. Levels of ozone exceed both national and State standards everywhere in the South Coast Air Basin. In 1989, the peak ozone reading was almost three times the Federal standard. The Los Angeles urban area exceeds this standard more frequently than any other area in the United States, and also records the highest peak readings.

National and State standards for CO are exceeded in more densely populated Los Angeles and Orange counties. The South Coast Air Basin is the only area in the nation considered to be a non-attainment area for NO_2. However, the Federal standard has not been exceeded during the last three years; three years of no exceedances are required to reconsider the attainment status of an air basin. The number of readings over the standard fluctuates from year to year, depending on weather patterns. PM_{10} levels regularly exceed the Federal and State standards in Los Angeles, Riverside, and San Bernardino counties, and State standards in Orange County. Sulfur dioxide and lead levels in all areas of the South Coast Air Basin are below national and State standard limits.

Traffic-congested roadways and intersections have the potential to generate localized high levels of CO. Localized areas where ambient concentrations exceed State and/or Federal standards are termed CO “hotspots”. The SCAQMD recommends the use of CALINE4, a dispersion model developed by the California Department of Transportation

(Caltrans) for predicting CO concentrations near roadways, as the preferred method of estimating pollutant concentrations at various locations. CALINE4 adds roadway-specific CO emissions calculated from peak traffic volumes to ambient CO air concentrations. For this analysis, CO concentrations were calculated based on a simplified CALINE4 procedure developed by the Bay Area AQMD. This methodology assumes worst-case conditions (i.e., wind speed of less than one meter per second and extreme atmospheric stability) and provides a screening of maximum, worst-case, CO concentrations.

The SCAQMD also recommends that the CO analysis focus on "sensitive receptors." Sensitive receptors are populations that are more susceptible to the effects of air pollution than are the population at large. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities.

Construction phase emissions would be generated by stationary construction equipment, and from mobile construction vehicles. Throughout the operation of the completed project, motor vehicle travel to and from the project site, as well as on-site stationary area sources such as water and space heaters, landscape maintenance equipment, and consumer products, would result in daily air emissions. An assessment of construction and operational emissions is presented below based on the methodologies recommended in the SCAQMD's CEQA Air Quality Handbook.

The most important climatic and meteorological characteristics influencing air quality in the study area is the persistent temperature inversions, predominance of onshore winds in Orange County, mountain ridge and valley topography, and prevalent sunlight. Air quality is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects. The degree of air quality degradation is then compared to ambient air quality standards (AAQS). Pollutants considered include Ozone (0_3), Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Suspended Particulate Matter (PM_{10} and $PM_{2.5}$), Sulfates, (SO_4), Lead (Pb), Hydrogen Sulfide (H_2S), Vinyl Chloride, and Visibility Reducing Particles.

The California AAQS are generally more stringent than the corresponding National standards. Air quality in the South Coast Air Basin (SCAB) regularly exceeds National AAQS for ozone, carbon monoxide, nitrogen dioxide, and suspended particulates. An analysis of the air quality impacts of different types of dredge and support equipment will be performed for this study.

Annual ambient air quality monitoring has been conducted at two locations (El Toro and Costa Mesa) approximately 20 miles north of the project area between 1992 and 1997. The El Toro monitoring stations recorded concentrations of O_3, CO, and PM_{10} while the Costa Mesa stations monitored O_3, CO, and NO_2. Table 3.6-1 presents the results from these monitoring stations for the years 1997 through 2000.

As presented in Table 3.6-1, maximum ozone concentrations and number of violations recorded in both the Costa Mesa and El Toro monitoring stations have decreased between 1997 and 2000. The NO_2 concentrations at Costa Mesa did not exceed the CAAQS during the 1997 to 2000 time frame. Exceedances of the CAAQS for PM_{10} concentrations at El Toro have fluctuated over the subject time period, but more current levels show a marked decrease.

With regard to CO concentrations, the maximum CO concentrations recorded in Costa Mesa and El Toro have declined over the last 5 years. It should be noted that during the subject time period, the Costa Mesa monitoring station did not record PM_{10} concentrations, and the El Toro monitoring station did not record concentrations for oxides of nitrogen (NO_X).

The high frequencies of southwest to northwest sea breezes recorded in Costa Mesa and El Toro have declined over the last 5 years. The high frequency of southwest to northwest sea breezes usually occur during the daytime for most of the year and transports air pollutants away from the coast toward the interior regions in the afternoon hours. As a result, air quality conditions along the coast, such as Newport Bay, are typically better than the conditions presented for the interior Costa Mesa and El Toro Monitoring Stations (Table 3.6-1).

Table 3.6-1. Ambient Pollutant Concentrations Registered at the South Coastal Air Quality Monitoring Station

Pollutant	1997	1998	1999	2000
Ozone (O3)				
Maximum 1-hr. Concentration (ppm)	0.12	0.13	0.1	0.1
Maximum 8-hr. Concentration (ppm)	0.08	0.08	0.08	0.075
Days > Federal 1-hr. Standard Exceed	0	1	0	0
Days > State 1 hr. Standard Exceed	0	2	0	1
Carbon Monoxide (CO)				
Maximum 1-hr. Concentration (ppm)	10	8	8	9
Maximum 8-hr. Concentration (ppm)	5.8	5.3	5.3	7
Days > Federal 1-hr. standard exceed	0	0	0	0
Days > State 1 hr. Standard Exceed	0	0	0	0
Nitrogen Dioxide (NO)	4.4	4.5	3.8	7
Maximum 1-hr. Concentration (ppm)	0.14	0.15	0.12	0.13
Days > State 1 hr. Standard Exceed	0	0	0	0
Sulfur Dioxide				
Maximum 1-hr. Concentration (ppm)	0.05	0.07	0.08	0.17
Maximum 24-hr. (ppm)	0.014	0.017	0.016	0.017
Particulates (PM10)				
Maximum Concentration (ug/m3)	105	110	109	74
Days < State Standard	12	14	13	9

Sources: South Coast Air Quality Management District, 1997 Air Quality Data, 1998, Air Quality Data, 1999 Air Quality Air Data, and 2000 Air Quality Data (Diamond Bar, California: South Coast Air Quality Management District). Parts by volume per million of air (ppm), micrograms per cubic meter of air (ug/m^3), or annual arithmetic mean (aam). Pollutants shown are those for which the South Coast Air Basin has been designed as a Federal non-attainment area.

In addition to criteria pollutants, other regulated pollutants include toxic air contaminants (TACs), which are suspected or known to cause cancer, genetic mutations, birth defects, or other serious illnesses in exposed people. (The TACs are not regulated by the NAAQS or CAAQS, but are addressed by the National Emission Standards for Hazardous Air Pollutants [NESHAPs] and Title III of the 1990 Clean Air Act Amendments).

Generally, TACs behave in the atmosphere in the same way as inert pollutants. The level of emissions at the source determines the concentrations of both inert and toxic pollutants. Thus, impacts from toxic pollutant emissions tend to be site specific and their intensity is subject to constantly changing meteorological conditions. The worst meteorological conditions that affect short-term impacts (low wind speed, highly stable air mass, and constant wind direction) occur relatively infrequently.

3.6.1 Meteorology/Climate

The local climate is dominated by the strength and position of the semi-permanent high-pressure center over the Pacific Ocean near Hawaii. This high-pressure center results in cool summers, mild winters, and infrequent rainfall. It also drives the cool daytime breezes, maintaining comfortable humidities and abundant sunshine. Those same atmospheric processes restrict the diffusion and dispersion of air pollutants. Yet, coastal southern California typically experiences almost none of the unhealthful air quality found in other parts of the regional air basin.

Based on data from SCAQMD, temperatures in the coastal portions of Orange County average 61°F, with average summer temperatures of approximately 68 - 70°F and average winter temperatures of approximately 51 - 53°F. Rainfall averages about 12 inches per year in the coastal zones. In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable, with most rain falling from November through April.

Onshore winds across the south coastal region are from a westerly and southwesterly direction during the day while easterly and northeasterly breezes predominate at night. Wind speed tends to be somewhat greater during the dry summer months than during the rainy winter season. In January, light-to-moderate winds average 6 - 10 mph and blow from the northeast to the south-southwest more than three-quarters of the time. This flow is reversed during the day and the wind predominantly originates from the southwest at an average of 5 - 8 mph. Light winds averaging 3 - 6 mph originate from the east or southeast at night during July. This trend reverses during the day when winds predominate from the southwest, averaging 10 - 15 mph during the afternoon.

Periods of stagnation may occur, both in the morning and evening hours, between the periods of dominant air flow. These periods determine critical air quality parameters on any given day. Extensive surface high-pressure systems over the Great Basin, combined with other meteorological conditions, can result in very strong, down slope "Santa Ana" winds during, especially, the winter and fall months. These winds may continue for a few days before "typical" circulation patterns recur.

The southern California coast is prone to temperature "inversions" which are associated with high temperature episodes characterized by the worst smog conditions of the year. Within the SCAB, two types of inversions occur. Radiational inversions result from offshore descending airflows and nighttime radiational cooling. For the most part, these inversions are dry because of the continental origin of the subject air masses. Yet with high surface humidity there can be late night and early morning fog, or widespread dense fog lasting through several days. Marine, or subsidence, inversions may cap the surface marine layer and act as a barrier to vertical mixing because air that is denser than the air in the inversion and returns to equilibrium by sinking below the base. The combination of winds and inversions, combined with their seasonality, lead to the degraded air quality in summer and the generally good air quality in winter in the project area.

3.6.2 Regulatory (AQ) Requirements

Regulatory Setting

Federal, state, and regional agencies have established standards and regulations that affect proposed projects. The following federal and state regulatory considerations apply to the project and to all alternatives.

- The Federal Clean Air Act of 1970 directs the attainment and maintenance of NAAQS. The 1990 Amendments to this Act determine attainment and maintenance of NAAQS (Title I), motor vehicles and reformulations (Title II), hazardous air pollutant (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone protection (Title VI), and enforcement (Title VII).

- The EPA implements New Source Review and Prevention of Significant Deterioration.

- The CARB has established the CAAQS and determines attainment status for criteria air pollutants.

- The California Clean Air Act (CCAA, AB 2595) went into effect on January 1,1991. The CCAA mandates achieving the health-based CAAQS at the earliest practicable date.

- The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) requires an inventory of air toxics emissions from individual existing facilities, an assessment health risk, and notification of potential significant health risk when found to be present.

- The Calderon Bill (SB 1731) amends the 1987 "Hot Spots" Act (AB 2588). The bill sets forth changes in the following four areas: provides guidelines to identify a more realistic health risk, requires high risk facilities to submit an air toxic emission reduction plan, holds air districts accountable for ensuring that the plans will achieve their objectives, and high risk facilities will be required to achieve their planned emission reduction.

- The Tanner Bill (AB 2728). The bill amends the existing Tanner Bill (AB 1807) by setting forth provisions to implement the federal program for hazardous air pollutants.

- Toxic Emissions Near Schools (AB 3205). This bill requires new or modified sources of air contaminants located within 1,000 ft. from the outer boundary of a school to give public notice to the parents of school children before an air pollution permit is granted.

- Section 21151.4 of the CEQA discusses Hazardous Air Pollutant releases within 0.25 miles of a school.

The SCAQMD has jurisdiction in the counties of Los Angeles, Orange, Riverside, and the western non-desert portion of the San Bernardino County. Rules and regulations of this agency are designed to achieve defined air quality standards that are protective of public health. To that purpose they limit the emissions and the permissible impacts of emissions from projects, and specify emission controls and control technologies for each type of emitting source in order to ultimately achieve the air quality standards.

Non-attainment areas are required to prepare a schedule including applicable measures to bring the area into attainment of all federal and state ambient air quality standards. This is demonstrated through the State Implementation Plan (SIP). The Air Quality Management Plan (AQMP) serves as the applicable document to demonstrate consistency with the SIP for the South Coast Air Basis. The SCAQMD and the Southern California Association of Governments (SCAG) are the agencies responsible for preparing the AQMP for the SCAB. Since 1979 a number of AQMPs have been prepared. The most recent comprehensive plan fully approved by the USEPA is the 1994 AQMP, which includes a variety of strategies and control measures. The 1994 AQMP was based on the 1991 AQMP and was designed to comply with state and federal requirements. The goal of the 1994 AQMP was to reduce the high level of pollutant emissions in the SCAB, and ensure clean air for the region. Projected attainment dates for criteria pollutants are presented in Table 3.6-2. To accomplish its task, the AQMP relied on a multilevel partnership of governmental agencies at the

federal, state, regional and local level. These agencies (i.e., the USEPA, ARB, local governments, SCAG, and SCAQMD) are the cornerstones that implement the 1994 AQMP and previous AQMP programs.

Table 3.6-2 2000 Carbon Monoxide Air Quality Data

No.	Location	Station No.	No. Days of Data	Maximum Conc. (ppm/hour)	Maximum Conc. (ppm/8-hour)	No. Days Standard Exceeded	
						Federal > 9.5 (ppm/8-hour)	State > 9.0 (ppm/8-hour)
Orange County							
16	North Orange County	3177	364	14	6.1	0	0
17	Central Orange County	3176	360	8	6.8	0	0
18	North Coastal Orange County	3195	339*	8*	6.3*	0*	0*
19	Saddleback Valley 1	3186	244*	5*	2.3*	0*	0*
19	Saddleback Valley 2	3812	305*	4*	3.3*	0*	0*

Notes:

>	Greater than
No.	Number
Conc.	Concentration
ppm	Parts per million

The AQMP is a dynamic document that is updated every 3 years. The 1997 AQMP is based on the 1994 AQMP and carries forward most of the strategies included therein. However, with recent findings by nationally recognized health experts, the new Plan puts greater emphasis on PM_{10} particulate matter. In fact, the 1997 AQMP is the first plan required by federal law to demonstrate attainment of the federal PM_{10} ambient air quality standards. The 1997 Plan also updates the demonstration of attainment of the federal PM_{10} ambient air quality standards. The 1997 Plan also updates the demonstration of attainment of ozone and carbon monoxide. Additionally, because the Basin came into attainment of the federal nitrogen dioxide standard since the prior AQMP was prepared, the new AQMP includes a maintenance plan to assure continued compliance.

The 1997 AQMP also addresses several state and federal planning requirements and incorporates new scientific data, primarily in the form of updated emissions inventories, ambient measurements, and new air quality models. Expanding on the control strategies included in the 1994 AQMP, the 1997 AQMP projects sufficient emissions reductions to meet all federal criteria pollutant standards within the time frames allowed under the federal Clean Air Act.

The 1997 AQMP also addresses notable regulatory rules promulgated since the preparation of the 1994 Plan. These include the implementation of Phase II reformulated fuels in 1996, the replacement of Regulation XV rideshare program with an equivalent emission reduction program, and new incentive programs for generating emission credits. Other highlights of the 1997 AQMP are noted below.

- Use of the most current air quality information (1995), including special particulate matter data from the PM_{10} Technical Enhancement Program;
- Improved emissions inventories; especially for motor vehicles, fugitive dust, and ammonia sources;
- A similar, but fine tuned overall control strategy with continuing emphasis on flexible, alternative approaches including intercredit trading;
- A determination that certain control measures contained in the 1994 AQMP, are infeasible, most notably the future indirect source measures;
- Enhanced modeling for particulates;
- Attainment to the federal Post-1996 Rate-of-Progress Plan and the Federal Attainment Plans for ozone and carbon monoxide;
- A maintenance Plan for nitrogen dioxide; and
- An attainment demonstration and State Implementation Plan Revision for PM_{10}.

Federal Clean Air Act Requirements

Federal, state, and regional control authorities regulate air quality in the Basin. The EPA is involved in local air quality planning through the federal Clean Air Act (CAA), as amended by the Clean Air Act Amendments of 1990. The CAA requires plans to provide for the implementation of all reasonably available control measures "as expeditiously as practicable," including the adoption of reasonably available control technology for reducing emissions from existing sources. The CAA explicitly encourages emission control innovations in the form of market-based approaches. The SCAQMD is the first local agency in the nation to adopt a market-based plan for controlling stationary source emissions of oxides of nitrogen and sulfur and, in accordance with the pending revisions, is proposing additional market-based control measures. Other federal requirements addressed in the revision include mechanisms to track plan implementation and milestone compliance for O_3 and CO.

In addition, the 1990 amendments to the CAA require the SCAQMD to develop the following demonstrations or plans addressed in the 1994 Air Quality Management Plan (ACMP) (discussed below): (1) a 3 attainment demonstration; (2) a post-1996 rate-of-progress demonstration, and (3) a PM_{10} State Implementation Plan(SIP)(required in 1996) that incorporates best available control measures for fugitive sources.

California Clean Air Act Requirements

In addition to federal requirements, the Basin is subject to requirements set by the state. The California Clean Air Act (CCAA), amended in 1992, requires all air districts in the state to endeavor to achieve and maintain state AAQS. According to the CCAA, air pollution control districts must design their air quality attainment plans to achieve a reduction in basin wide emissions of 5 percent or more per year (or 15 percent or more in a 3-year period) for all non-attainment pollutants and their precursors. For emission reduction accounting purposes, the California Air Resources Board (ARB) has established a 7-year initial reporting period (1988 to 1994), with reporting intervals every 3 years thereafter. As a result, the 1994 AQMP must seek to achieve a 35 percent reduction for the initial period and a 15 percent reduction for every subsequent interval.

The CCAA also required that the 1994 AQMP control measures reduce overall population exposure to criteria pollutants, with a 40-percent reduction due by the end of 1997 and a 50-percent reduction by the year 2000. This provision is applicable to O_3, CO, and NO_2 in the SCAB. The CCAA further requires the SCAQMD's Governing Board to determine that the 1994 AQMP is a cost effective strategy that will achieve attainment of the state standards by the earliest practical date. The 1994 AQMP must also include an assessment of the cost-effectiveness of available and proposed measures and a list of the measures ranked from the least cost-effective to the most cost-effective. In addition to cost-effectiveness, other factors must be considered, including technological feasibility, emissions reduction potential, and rates of reduction, public acceptability, and enforceability.

Regional Air Quality Management Planning

The SCAQMD and the SCAG are the agencies responsible for preparing the AQMP for the SCAB. Since 1979 a number of AQMPs have been prepared. The most recent comprehensive plan fully approved by the EPA is the 1994 AQMP, which includes a variety of strategies and control measures. The 1994 AQMP was based on the 1991 AQMP and was designed to comply with state and federal requirements. The goal of the 1994 AQMP was to reduce the high level of pollutant emissions in the SCAB and ensure clean air for the region to accomplish this task, the AQMP relied on a multilevel partnership of government agencies at the federal, state, and local level. These agencies (e.g., the EPA, ARB, local governments, SCAG, and SCAQMD) are the cornerstones that implement the 1994 AQMP and previous AQMP programs.

The most recent version of the AQMP (1997) is still undergoing EPA review for incorporation as the SIP. The 1997 AQMP is based on the findings of the 1994 Plan and carries forward most of the strategies included therein. However, with recent findings by nationally recognized health authorities, the new plan puts greater emphasis on PM_{10} particulate matter. In fact, the 1997 plan is the first plan required by federal law to demonstrate attainment of the federal PM_{10} ambient air quality standards. The 1997 Plan also updates the demonstration of attainment of O_3 and CO. Additionally, because the Basin came into attainment of the federal NO_2 standard since the prior AQMP was prepared, the new plan includes a maintenance plan to ensure continued compliance.

3.7 Noise

Background noise levels are generally low, due to the limited traffic and residential nature of the area. Two major sources of noise exist in the San Clemente Beach region: rotorcraft air operation training at Camp Pendleton, south of the southern most region of the San Clemente Beach area, occurring periodically throughout the year; and temporary construction activities. Noise levels occasionally impair normal conversation.

Dominant noise sources include waves, beach recreation activities, and vehicle noise on adjacent roads. The sound of wave action will vary with factors including wave height, period, frequency, angle of attack, season, and wind conditions.

3.8 Socioeconomic

3.8.1 Local Socioeconomic Conditions

As the project is primarily located within the shoreline areas of the City of San Clemente, this section focuses on the socioeconomic conditions of the City. Socioeconomic data for the City are sourced from the City of San Clemente Housing Element of the General Plan, dated June 2002. These data are generally more representative of the local conditions than the much broader data sets for the unincorporated areas within the project area, north of the City.

San Clemente is the southern-most city in Orange County. Its coastal setting, Mediterranean climate, and rolling hills provide a unique and attractive living environment. This resort setting affects the City's employment characteristics and economic base.

San Clemente has been one of the fastest growing cities in Orange County since 1980. This growth peaked by 1985 and 1990 with a 6.7% annual growth rate compared to 1.7% for the rest of the County, but has continually outpaced the County's growth rate through the present. Since 1980, the City's population has nearly doubled from 27,322 persons to 50,032 persons in 2000 for an annual average increase of 1,149 persons per year.

In concert with this fast pace of growth, housing development also grew proportionately. The City's housing stock grew from 13,233 units in 1980 to 20,872 units in 2000, with the largest increase in housing growth occurring between 1985 and 1990. During this period housing stock grew by 859 units per year. It is estimated that current housing growth will average approximately 800 units per year through the year 2005.

Based on an inventory of vacant residential land within the City, up to 4,924 residential units could be constructed in the City by 2005. The majority of this growth will occur on the eastern portion of the City, east of Interstate 5, on newly annexed ranchland. Less than 700 units are expected to be constructed west of I-5, with the majority of these units constructed as infill developments within the existing downtown area.

San Clemente is located within relatively easy commuting distance from employment centers of Los Angeles and Orange Counties, as well as the fast-growing Northern San Diego County and Camp Pendleton. Due to the higher wages offered in these areas and the relatively low-cost of living in San Clemente, the City serves as a bedroom community with a large number of commuters. However, a need for lower-wage labor in the commercial and service centers continues to increase in San Clemente, especially in relation to the tourism industry.

3.8.2 Onsite Socioeconomic Conditions

The project area is located along the San Clemente shoreline, which is characterized by narrow, linear sandy beach, backed by high coastal bluffs. Thus, development within the confines of the project area boundaries is generally limited.

The Capistrano Shores Trailer Court, a private community of mobile homes, is located at the northern end of San Clemente immediately adjacent to the narrow sandy beach. While mobile homes often provide a low-cost housing resource, these homes are not considered as such due to their prime beachfront location. Most other residential units in the City are set back from the shoreline and, thus, are not within the project area.

Several commercial structures are located along the shoreline and within the project area. The focal point of the beach is a 400-meter fishing pier, which houses a bait-and-tackle shop and a full-service restaurant. Semi-permanent rental shops, which offer umbrellas, surfboards, body boards, and other beach accessories, are also located along the beach. Several fast-food restaurants are located at North Beach, "T" Street Beach, and Calafia Beach Park. These commercial uses provide employment opportunities, mostly in the relatively low-paying retail and service sectors. Most of these commercial uses are directly related to the tourist trade associated with beach visitors.

Public facilities within the project area are operated and maintained by the City of San Clemente and the Orange County Department of Harbors, Beaches, and Parks. These facilities include the Marine Safety Building, public restroom facilities, lifeguard stations,

parking areas, and paving near the pier. These facilities also provide employment opportunities similar to the commercial uses and also directly related to beach visitors.

Surfing as well as camping, picnicking and other dispersed recreation are a large recreational economic base to the locale and in particular to the City of San Clemente economies. Many of these places are found in San Clemente:

- Best Surfing Beaches – Doyen Beach, North Beach, 204, San Clemente Pier, T-Street, Calafia, San Clemente State Beach, and Trestles
- Best Picnic Beaches - San Clemente Pier, North Beach
- Best Secluded Beaches - Lost Winds, Linda Lane, Riviera
- Best Camping Beaches - San Clemente State Beach

Surfing is a major component of San Clemente's recreational base. Surfing has been recorded at several locales within the study area boundary: ***Reach 1*** (Trestles), ***Reach 3*** (San Clemente State), ***Reach 4*** (Calafia), ***Reach 6*** (San Clemente Pier, north side and south side), ***Reach 7*** (204), ***Reach 8*** (North Beach), and ***Reach 10*** (Doyen Beach).

3.9 Transportation

This section describes the existing transportation network, as related to project proposed activities. Local streets, roads and railway transport methods will not be used, in this project, as originally discussed in the initial City of San Clemente publication. Instead, offshore collection locations of beach replenishment material will be made available via offshore gathering of oceanographic deposition. This will be accomplished utilizing collection barges and delivery will not affect local traffic flow.

Traffic benefits, associated with this project, will mainly be realized by rail service. Presently, the rail corridor provides a major source of revenue and commuter travel for the entire south pacific portion of Southern California. This benefit will drastically decrease beachfront erosion, thus creating a more stable and safe environment for rail service. Presently the safety of rail service requires occasional preventative maintenance in the form of rail bed erosion monitoring and prevention, utilizing riprap.

According to Orange County Transportation Authority (OCTA), it has been necessary to place riprap along the most critical segment between North Beach and the Marine Safety Building to decrease wave erosion impacts. Over a three – year period, OCTA has spent between $200,000 and $300,000 to manage this activity. Crews are dispatched during high tide and storm conditions to visually inspect the track for damage that could cause derailment. This railroad is a vital transportation link for passenger and freight service. Furthermore, the Department of Defense has designated this right-of-way as a Strategic Rail Corridor with great significance to National Defense. Continued erosion along the San Clemente shoreline will lead to further disruption of rail service, National Security issues and transportation delays

3.10 Land Use

The City of San Clemente, including the unincorporated area, is comprised primarily of residential, industrial, commercial, agriculture and vacant properties.

The North Beach locale is immediately adjacent to the MetroLink Station and parking lot, and just south of a row of beachfront mobile homes. The North Beach setting is bounded on the east by the MetroLink station, a City-operated public pool, and a residential area on the bluff tops, a residential mobile home park to the north, and the Pacific Ocean to the west. This beach is typically narrow and is backed by a low stone revetment along portions of its length. It is composed of medium to coarse sand. This area is a public beach with access provided from a public parking lot by a walkway and a railroad crossing

The Linda Lane Beach surroundings are located south of Mariposa point and north of the San Clemente pier. The Linda Lane Beach environs is bounded by a residential area on the bluff tops, a rock revetment to the east, the San Clemente Pier to the south, Mariposa Point to the north, and the Pacific Ocean to the west. This beach experiences severe erosion periods the beach is backed by a stone revetment near its north end and an access road near the south end, fronted by a steeply sloping beach to the water line. This site includes the beach fronting the Marine Safety Headquarters. Pedestrian access at Linda Lane occurs over the railroad tracks.

The T-Street Beach Fill Sites are bounded by the railroad tracks to the east, the San Clemente Pier to the north, a public beach to the south, and the Pacific Ocean to the west. The Animal Shelter Stockpile Site is approximately 1.0 acre in area and has been occasionally used as a contractor equipment and materials storage site for the City of San Clemente Water Reclamation Plant and adjacent business. No physical features exist that could divide the existing land use along the San Clemente Beach regions. Existing residences are located adjacent to the study area. Therefore, the project will neither disrupt nor divide any established community.

3.11 Recreation

This section presents information on recreational activities and opportunities within the San Clemente Beach area, and summarizes the recreation setting. As described in section 3.10 (Land Use), residential and open space (including recreation) is the predominant land uses within the study area. The Beaches, Parks and Recreation Departments are responsible for citywide maintenance and management of recreational programs and facilities. Its operating divisions include among others: Marine Safety, Beaches and Parks Maintenance, and Recreation.

3.11.1 Marine Safety

The Marine Safety Division is responsible for the lifeguard operation on the City's 20 acres of sand beach. In addition, the division manages seven snack bars, restaurant, bait and tackle and pier telescope concession operations (including the Fisherman's Restaurant). This division provides ocean rescue, first aid, law enforcement and various public education programs including a junior lifeguard and instructional surfing and monitors related environmental issues such as off-shore oil and coastal erosion on an ongoing basis in addition to assisting in planning related capital improvement projects.

3.11.3 Beach and Park Maintenance

The Beaches and Parks Maintenance Division is responsible for the maintenance of the city's 20 acres of beach, the primary attribute within the project area, as well as among other recreational type facilities. Recreational facilities include a 1,200 foot fishing and sight seeing pier.

3.11.4 Beaches

San Clemente State Beach is popular with surfers on the north end of the one-mile beach. Other popular activities are skin diving and hiking along the trails on the bluffs. The beach has a landscaped bluff top with picnic areas. Trails lead down to the beach, which is also popular for body surfing, swimming, and skin diving.

3.11.5 San Clemente Pier

The town and the pier itself were both developed by Ole Hanson during the land boom days of the “Roaring’ Twenties.” His vision foresaw a “Spanish village by the sea,” where all the houses were white with red tile roofs. The pier itself was built in 1928 and was a favorite site to smuggle liquor into the county during prohibition. The hurricane of 1939 destroyed much of the pier including the café, tackle shop, and Owl Boat Co. fishing operation out at the end of the pier. It was rebuilt for only $40,000. The storms of 1983 tore out 400 feet from the end of the pier and 80 feet from the mid-section area, just past the surf area. Repairs in 1985 cost $1.4 million. When rebuilt, the end section was built 3.5 feet higher, and polyethylene-coated steel piles were used to better withstand winter storms. San Clemente itself was named after San Clemente Island. The island was given its name November 25, 1602 by the Spanish explorer Sebastian Vazcaino. He named it San Clemente in honor of Saint Clement whose feast day is November 23.

The stretch of the San Clemente Coast is known for excellent surf-fishing and for offshore kelp beds. To the north is fish-rich Dana Point and to the south is the warm-water area around the San Onofre Nuclear Power Plant. The pier itself is located over a sand beach and the pier’s pilings, which were built in 1928, are heavily covered with mussels. In addition, a reef was constructed out near the end of the pier. Inshore wave action is typically mild, and out toward the end of the pier the water depth, although

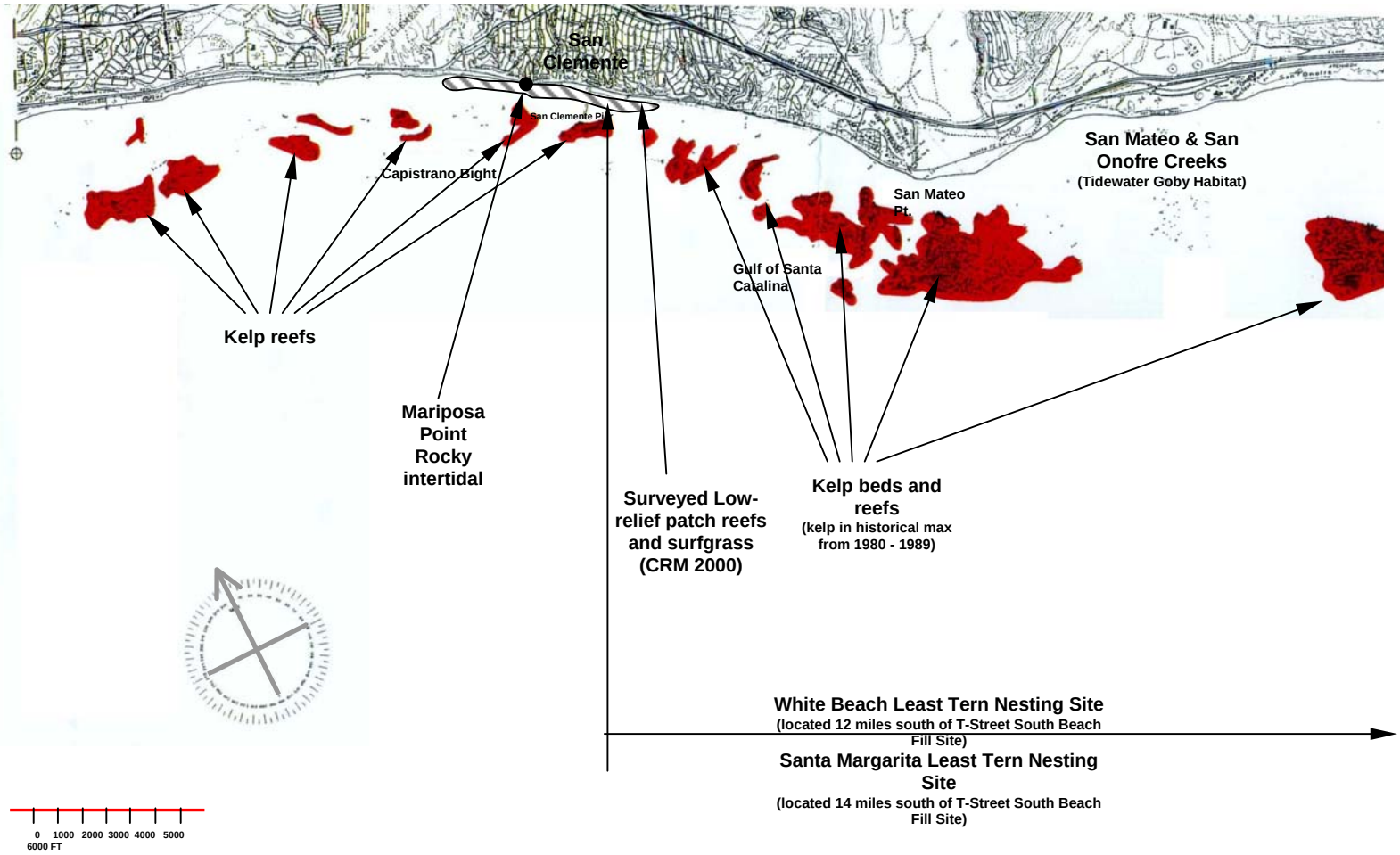
moderate, is certainly sufficient for most pelagic species. Inshore, anglers should expect to hook corbina, spotfin croaker, yellowfin croaker, a few sargo, barred surfperch, guitarfish, various rays, and small sharks. The mid-pier area will yield all of these and, in addition, offer white croaker, queen fish, halibut, sand bass, silver and walleye surfperch, sculpin (California scorpionfish), salema and jacksmelt. The far end of the 1,296-foot-long pier will see all of these but also yield up more bonito, mackerel, jack mackerel, barracuda and a few small yellowtail. The end section is preferred by the shark specialists.

3.11.6 Annual Events

The San Clemente Ocean Festival, which is held in July, has a full weekend of family events include lifeguard games, a fishing derby, sand sculpture contest, art exhibit, car show, games, beach party and concert. The San Clemente Ocean Festival is a non-profit organization in partnership with the City of San Clemente. A two-day event is held annually which brings families, athletes and local community members to the beach-city of San Clemente for fun, food and entertainment. The main sporting event of the City of San Clemente is the California Waterman and Waterwoman Championships, which includes many sporting events:

The San Clemente Sea Fest, which is held in October, is sponsored by the San Clemente Chamber of Commerce, which includes a plethora of events.

Figure 3.3-1. San Clemente Beach Biological Resources



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